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ENVIRONMENTAL ASSESSMENT BOARD

Ontario

ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 52

DATE: Wednesday, August 28, 1991

BEFORE:

HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

FARR & ASSOCIATES REPORTING INC.

(416) 482-3277

2300 Yonge St. Suite 709 Toronto, Canada M4P 1E4

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ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act, R.S.O. 1980, c. 140, as amended, and Regulations thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro consisting of a program in respect of activities associated with meeting future electricity requirements in Ontario.

Held on the 5th Floor, 2200 Yonge Street, Toronto, Ontario, on Wednesday, the 28th day of August, 1991, commencing at 10:00 a.m.

VOLUME 52

B E F O R E :

THE HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

S T A F F :

MR. M. HARPUR	Board Counsel
MR. R. NUNN	Counsel/Manager, Informations Systems
MS. C. MARTIN	Administrative Coordinator
MS. G. MORRISON	Executive Coordinator

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C. MARLATT) D. ESTRIN)	NORTH SHORE TRIBAL COUNCIL, UNITED CHIEFS AND COUNCILS OF MANITOULIN, UNION OF ONTARIO INDIANS
D. POCH) D. STARKMAN) D. ARGUE)	COALITION OF ENVIRONMENTAL GROUPS
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LIST of EXHIBITS

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No.	Description	Page No.
267.7	Ontario Hydro to provide the portion of new construction square footage it expects savings by design to affect throughout the province.	9560

---Upon commencing at 10:03 a.m.

THE CHAIRMAN: Be seated please.

Mr. Poch.

MR. D. POCH: Thank you, Mr. Chairman.

PAUL JONATHAN BURKE,
AMIR SHALABY,
JULIA MARION MITCHELL,
MARION ELIZABETH FRASER,
LYN DOUGLAS WILSON,
WILLIAM OSBORNE HARPER; Resumed.

CROSS-EXAMINATION BY MR. D. POCH (Cont'd):

Q. Panel, when we left off yesterday we had spent some time talking about market barriers, about drivers to program success. We had coined two, if I may, being the number of customers that participate and the number of measuress for those customers as two indicators or two drivers.

And we had summarized a number of market barriers which good program design and Hydro paying can help overcome. And you had agreed that higher incentives can often overcome some of these market barriers, not just access to capital.

And we were going to turn to some examples.

MS. FRASER: A. I think I said that incentives can, not necessarily higher incentives.

Q. And what you are telling me is that

you may have already gone as far as is productive with incentives in a given case?

A. Yes.

Q. Let's look at an equipment turnover replacement scenario. Suppose a customer's electric water heater fails unexpectedly, can you describe how that tank will generally be replaced if it is owned by the customer.

MS. MITCHELL: A. Generally the customer will contact a contractor who will install a new tank.

Q. So, the customer wouldn't typically take the time to shop for heaters of varying efficiency levels, the typical customer?

A. Not typically. However, all the tanks are CSA approved.

Q. So, generally within this realm of CSA approved tanks the plumber would recommend a replacement and indeed would probably go and buy it and then charge the customer for it?

A. Yes.

Q. All right. And I take it your experience isn't that plumbers do detailed discounted cash flow cost/benefit analysis, accounting efficiency and avoided costs.

A. I am not experienced with how

plumbers think.

Q. Can we agree that in this case there would be a number of barriers at play. First, cost or the financial barrier may be at play?

A. Possibly.

Q. Lack of customer information?

A. Possibly.

THE CHAIRMAN: I am not quite sure I understand what this line of questioning is getting at. Perhaps you can help me, explain it to me. What are you trying to achieve by this particular line of cross-examination.

MR. D. POCH: Mr. Chairman, I am attempting to show - and we will come to Hydro's levels in a few moments - that Hydro incentives levels have not been set and more importantly, I think, for this hearing, even if some of these lessons are being learned or do get learned, their plan has been premised on a presumption of penetration and incentive level and program design which does not overcome many of these barriers, hence the relatively low penetration rates.

And so I am just going through some hypotheticals before going into the actual programs.

THE CHAIRMAN: I think it would be more useful to me if you went into the actual programs.

MR. D. POCH: All right.

Q. Could you turn up Volume 2 of our materials, Exhibit 270 at page 106. Can we agree this is a case, this Interrogatory 4.7.99 at page 106, this indicates that in the energy efficient lighting and savings by design programs, the incentive levels were increased from the originally struck ones to ensure program success?

MS. FRASER: A. That's true. Correct.

Q. So, when the incentives were lower, this wasn't achieving the success that your targets indicated you were shooting for?

A. What we found out in the savings by design is that there were a number of large projects that had been identified jointly with the customer and our field staff that were really on the brink and could go, but it just didn't deal with their payback threshold and so we increased the incentive and they went ahead.

Q. Right.

A. Based on that real experience.

Q. Without increasing your incentives in that case, you might not have achieved in your words, ensured in your words, "program success". You might have fallen short of your targets but you reacted and

you changed the incentives?

A. Absolutely. That was our intent when we went into the marketplace.

Q. I take it that you have achieved a greater customer participation in savings by design, for example, because of that raising of incentives?

A. Yes, I had some data in my direct evidence where I charted the increase in activity. We are now up to over 1,000 applications.

Q. If you could turn back to page 103, Interrogatory 4.7.73 indicates in the bottom line that there is no program that Ontario has committed and then decided to terminate or scale back. So, there has not been a case when you have reduced incentives because customer response was too high?

A. The one case in commercial where we reduced incentives is for fluorescent power reducers. The price that was being charged when we set the incentive, the incentive was appropriate but the price came down because of the uptake in the market and economies of scale and all the rest of it and our incentive level was no longer giving the signal that we wanted to vis-a-vis the rest of the equipment so we reduced that.

Q. So, that was a case where you just

re-evaluated what incentive you felt was necessary given the customer cost?

A. Exactly.

Q. It wasn't a case where you were experiencing too much response yet, was it?

A. No, it was totally relative to the package of incentives for the overall lighting program. Fluorescent power reducers reduce the lighting level and they are not necessarily the optimum kind of application in the long term that we are looking for.

Q. Can you turn back to page 88. This and the following pages are from the PCRD description of the savings by design program you have spoken of.

And I see here that at the top of page 89, it notes that higher incentive levels are required to attract more customers and avoid lost opportunities in new construction.

A. Correct.

Q. And at the bottom of the page, we note an incentive of $500 per kilowatt. The limit of 50 per cent of the incremental project cost is maintained. That would be not for new construction, I take it?

A. Right now it's still applying in new construction except for T8 lighting. We are designing

the enhancement to savings by design. It will be based on ASHRAE 90.1 and that is referred to on the next page in the paragraphs, and those incentives will equate to about 1,000 dollars a kilowatt and will cover the full incremental cost in new construction to come up to that standard and then will provide an even more enriched incentive to go past that.

Q. The point here is you have raised incentives for new construction and I take it that's because you don't want to miss lost opportunities?

A. Yes. And it's cheaper to do it at new construction than retrofit. In some cases there are things you can never do in a retrofit basis that you can do in new construction.

Q. But the measure for retrofit that you would cover were nevertheless cost effective?

A. Yes, the measures we would cover.

Q. But you are raising your incentive for new construction to get some assurance that you will get better penetration and timely penetration in that market where there is concern for lost opportunities?

...

[10:13 a.m.] A. Absolutely.

Q. All right. I take it the concern then - this jargon we are using, lost opportunities - just to clarify, if you missed that window of opportunity when someone's building, or other lost opportunities you have, in effect, locked in some inefficiency which would be more expensive--

A. It might be impossible--

Q. --or impossible to get at later?

A. --to address without putting a new shell around the building.

Q. Right. Isn't it true though that every cost-effective measure that a participating customer in a program where you have got a multi-measure program - you are going into peoples' houses and doing a bunch of things - in that scenario, every cost-effective measure that that customer does not end up installing is also a lost opportunity?

A. Well, I don't see energy efficiency as a one-shot deal, I see energy efficiency as something that we are going to be doing essentially forever in the sense that technologies are going to change, rate structures are going to change, avoided costs are going to change, we are going to be constantly harvesting energy efficiency in the

buildings that we have existing right now and as new construction techniques are developed, as incentives are out there, it's going to bring new technologies into play that weren't before.

One of the things that is critical in savings by design, for example, is not that we prescribe what has to be done with a building, it's really that the -- it's to get the engineering community and the architectural community thinking about the ways in which they can bring their skills to bear on this issue.

It's not something that Hydro can, you know, either sit as Big Brother or sit in an ivory tower and say: Gee, if you did "x", "y" and "z" everything would be perfect.

I think that's a very important thing to remember in terms of energy efficiency, and certainly in terms of what we are going after in savings by design. That is the same philosophy that we have used in the guaranteed energy performance program which -- the material hasn't been included in your exhibit.

But what we found when we talked to energy service companies was that as they basically went in and started maintaining and operating buildings and looking after buildings for customers, that they

could constantly keep working at it; the things that they found in their first audit were not necessarily the total sum of what had to be done over the three or four year contract that they were involved in, that they kept going and finding and enhancing the savings that were there.

And that's one of the reasons why in designing the guaranteed energy performance program that the incentive level -- the actual incentives that get paid are contingent upon the savings so that if they harvest more and more savings out of that, their incentive will increase commensurate with those savings.

Q. Let me try to simplify this a little. Ms. Mitchell, you may be able to help here because I was thinking of the residential example.

We saw how it became not cost-effective - Vicki Sharp's memo - when you were doing the residential walk-through, that if it was a gas-heated home, for example, the economies of delivering a whole bunch of measures in one program, in one visit, were diminished, and it would seem to me that every measure you don't get participation in in such a visit is going to be a lost opportunity in the sense that it's not cost-effective particularly to go back for one measure

later, you want to get these measures when you are in there any way and it may be a while until you get back again.

And just a second point on that that you could respond to, even though - and I hope Ms. Fraser's right, that conservation is an on-going process where we continue to harvest and that Mr. Burke is pleasantly surprised - the problem is, if we don't get it soon we are going to commit to more expensive supply; are we not?

MS. MITCHELL: A. Well, in answer to the first part of your question, I agree with you that it is cost-effective to undertake as many measures as possible in a given home in a single visit, however, not all measures are cost-effective to the customer to undertake at one time.

An example would be wall insulation, whereby if that is a recommended activity and the customer is not renovating at that time, it is not cost-effective to ask them to tear down the wall.

Q. I wasn't talking about opportunities that weren't ripe, I'm talking about of those that are considered cost-effective, meet your tests.

A. Well, wall insulation could be cost-effective and meet the test, but it doesn't mean

it's going to be undertaken immediately as you might suggest.

Q. Right.

A. So, I think where it's appropriate we make all of the recommendations for a particular home and we install as many measures as appropriate at that time.

Q. You'd agree if one of these opportunities was ripe but just didn't get achieved, one of the market barriers wasn't overcome, that would be in essence, to some extent, a lost opportunity because of this foregone economic efficiency of doing it at once, it may be a while until you could get back and do it again?

A. That's possible.

Q. All right. In Exhibit 25, at page 10 in the middle of the page it says:

> In some cases paying 20 per cent of the premium capital cost..., I guess that

means the incremental cost, or the incremental capital cost,

> ...of an efficiency upgrade may be all that's required to motivate customers; in other cases, paying 80 per cent of the additional costs may be

necessary.

It has been assumed that incentives will average about 50 per cent of the capital cost of efficiency upgrading.

And if you turn to page 108 of Volume 2 of our materials - in fact, the interrogatory begins at page 108 but the information I would like you to look at is on page 110 - in the table provided there you show that for identified EEI - and I take it virtually all the EEI is now identified, I'm not positive, I ask that clarification.

MR. WILSON: A. Yes, it is.

Q. All right. You are showing an incentive rate of 50 per cent assumed. So, first of all, that may help you, Ms. Fraser, in answering that undertaking I posed earlier.

Whereas, it was assumed 80 per cent for unidentified. First of all, can you tell me why so high for unidentified?

MS. FRASER: A. I think our expectations there would be those would be sort of the new things coming down the pike which were probably brought into -- as they come into the realm of being identified over the horizon so to speak, that they are things that were not cost-effective before and so just -- we start

bringing that down closer.

Q. Okay. So, you are agreeing that for the opportunities at the margin a higher incentive may be necessary to get --

A. Yes.

Q. And can I just clarify; what's the percentage of, is it of avoided cost?

A. Incremental capital cost.

Q. Incremental capital cost, all right. So, this percentage wouldn't be of the avoided cost plus this 10 per cent?

THE CHAIRMAN: Excuse me. It doesn't seem to be incremental capital cost, it seems to be capital cost on this particular table.

MR. D. POCH: Yes.

MR. WILSON: I believe it is incremental capital cost. Although the third line in the table is incremental capital cost per kilowatt, the next line is labeled capital cost, I believe that should be labeled incremental capital cost.

THE CHAIRMAN: All right, thank you.

MR. D. POCH: Q. I take it in most programs there's -- all right, let's leave that for a moment.

This percentage then that we have been

talking about for incentives, it doesn't get affected by this 10 per cent adder that we have heard about on avoided cost preference for some NUGs and conservation, it's not calculated on that.

MS. FRASER: A. The 10 per cent adder is used in the total customer cost test in terms of determining what's economic.

Q. All right.

A. The incentives aren't part of that calculation per se, however, they would also be included in the 10 per cent utility cost test where incentives are included. So, the 10 per cent gives us 10 per cent room on incentives as well.

...

[10:25 a.m.] Q. Well, let me just understand this. If I understand, you are saying the 10 per cent is used for screening?

A. Correct.

Q. What is considered economic. What's eligible as a program. How is it that the 10 per cent gives you more room on incentives, if you calculate your incentives based on incremental cost?

A. In terms of the -- if we use the utility cost test, which essentially says what's the avoided costs minus the program costs and the incentive costs, that gives us that extra 10 per cent room there. If you inflate avoided cost by 10 per cent, two sides to the equation then both have that 10 per cent room in them.

Q. All right, I will have to take a look at that, think about that.

A. But you are right, it is not the determining factor in incentives. It is a limit that we keep an eye on. However, what is more critical with setting incentive levels is what is it going to take to move the market in terms of what are the financial decisions that we are dealing with, what are the other kinds of barriers that we talked about yesterday, and what do you have to do to make something happen.

Q. This just may be semantic then. I had looked at page 120 of our exhibit, Interrogatory 4.7.110, and it said that - this was about incentives - and it talked about incremental cost of power, meaning avoided system costs. Then in your internal jargon avoided system close is allowed to include that 10 per cent?

A. For demand management measures, yes, or anything that saves energy.

Q. Mr. Shalaby, that's not a problem for you, from Panel 3?

MR. SHALABY: A. No, it is not.

Q. Good.

At page 94, we are asking about payback periods and so on. And at page 95, which is the second page of this interrogatory response, after the second paragraph, it says:

> For speculative builders in new construction, the appropriate payback period is zero years. That is no investment is acceptable.

This is a classic example of the split incentives I take it?

MS. FRASER: A. Yes.

Q. Isn't this true or near true,

whenever there is a split incentive situation?

A. Well, I think split incentives basically mean that. Split incentives sometimes it's there or not.

Q. Could you turn, in Volume 3 of our materials, to page 39. This is at page 39 of our Volume 3 of our materials, which is Exhibit 271. And this is an excerpt from the EPTAP report again, and I will read it in for your comment.

> In response to a question from the panel, Hydro stated that its estimates of conservation potential exclude all conservation measures that will pay for themself within three years on the ground that virtually all such measures will occur in any event. This assumption, which is an important limiting factor on the potential for conservation, is not substantiated by Hydro. The experience of some panel members indicates that the assumption is not warranted. The evidence suggests that customers implicitly assume very high discount rates and expect very rapid payback from energy efficiency when acquiring energy

using appliances. Moreover...

and I think this is key for this part of the cross,

...a large proportion of the people who make the purchase decision on appliances, one California study showed 70 per cent, do not, in fact, pay the energy bills for the appliances...

and it goes on to list examples,

...and they feel little incentive to pay extra for energy efficiency.

It suggests reducing the payback period to two years or one year would significantly increase the potential for demand options.

Has any effort been done to figure out what percentage of customers in Ontario fall into that split incentives situation?

A. I don't think we have quantified it that way, but that's exactly why we deal with a segmented approach within the commercial market and the industrial market. That's why we have designed programs like the accelerated payback program, which buys the payback down to one-and-a-half years for industrial customers. That's why in cases where we do have split incentives, like non-profit housing, we have paid 100 per cent of project costs.

I think what we have to be really careful with here is the difference between either observed things, such as the 50 per cent incremental, or the three year payback that was referenced here, from earlier Hydro studies. Those things have not necessarily restricted program design per se.

In our lighting program, there are lots of cases where we actually buy back to less than one year. For instance, for multi-residential buildings, where the lighting retrofit is most often hallway lighting, and we recommend them to go to hard-wired fixtures, compact fluorescent hard-wired fixtures, replace incandescent lamps. I mean those lamps are on in the hallways 24 hours a day. The payback is tremendous. They are then able to put new fixtures in as well.

Q. Ms. Fraser, I appreciate that in many cases you are going beyond 50 per cent incentives. But we have seen in the plan some very, what we consider, quite low assumptions for penetration, and they were based on a plan which we consider has quite low assumptions for incremental -- for incentive, and isn't the conclusion that can be drawn here that it is not surprising that the plan has relatively low attainment rate, because it was assuming, for example, only 50 per

cent incentives being the limit in many cases, yet Hydro has been told by groups like EPTAP that in 70 per cent of cases if you don't provide close to 100 per cent, you are not going to get it?

A. I would point out that where you pulled the 50 per cent figure from was Exhibit 25, which is in the 1989 Demand/Supply Plan. I believe Mr. Burke cited a reference in the load forecast that was done since then which makes some different assumptions. And if we want, we could have him read it again.

But I think it was very clear that in order for him to do his forecast of the impact of our programs to the year 2000, he was making assumptions that were much higher than 50 per cent incremental. So, I think it is important that we don't get confused with what was observed with respect to the initial development of programs, and which is then reflected as observations in Exhibit 25, becoming then the ground rules for the programs. Because it is clear we have moved far beyond what was written in that exhibit in 1989.

MR. BURKE: A. I'd like to add that the assumption that you have quoted here on page 39 of Volume 3 is an assumption that was included in our earliest conservation potential studies, when we had no

information particularly about behaviour in the Ontario marketplace, and we were making a simplifying assumption that a three year payback on average would apply. And that since then we have been much more discriminating and our statements no longer read like this.

We usually state, and I could pull out from the front of Exhibit 76 our definition of what becomes an induced measure, and it is not something that simply faces a three year payback barrier. It is something that may face a barrier due to payback or other barriers, and we have been quite explicit in the case of - I think I pointed this out in my direct - commercial sector apartment buildings, multi-residential segment, that there is a clear split incentive there. And so all kinds of measures are available that would not have a three year payback. Would be much less than a three year payback, and we have included these as part of the potential.

So, we have gone over it much more carefully, and in the industrial sector in particular, evidence has suggested that the rule of thumb of three year payback, which was quite popular and is still quite popular amongst noted energy experts, Art Rosenfeld of LBL uses the number three year payback all

the time as a sort of a yardstick for typical sort of split between what customers will do by themselves and what a utility might do, but that is an average, and in the industrial sector the results are much less, one to two years at the most, and in the residential sector typically three to five years is considered to be the payback level that customers are prepared to consider.

...

[11:35 a.m.] In the commercial sector it may be of the order of two or three years but in some segments considerably less; in other segments a little bit more.

What was a number that we required some empirical confirmation of which was reasonable to give a potential estimate has been refined over time to make it not a hard and fast rule of thumb that has screened out all of these opportunities you now suggesting.

Q. But Mr. Burke, when you struck 2000 for 2000, you were assuming that these measures with less than three year paybacks had been captured in your load forecast; they were part of naturally occurring EEI. That's why you didn't assume the need for induced EEI programs for them; correct?

A. Well, I think we have discussed the question of whether the year 2000 number necessarily means exactly what it meant several years ago.

Q. Could you answer my question. You assumed you didn't need programs, you didn't need strategic confirmation EEI, you didn't have in your adjustment, between the basic and the primary, anything for these measures because you assumed they were part of natural conservation in your load forecast?

A. No, I think you missed my point about averaging here. It is a point that pertains to the

incentive levels as well. The incentives might average a certain number but where they are need to be higher they are higher. Where for purposes of estimating potential in a theoretical way before we started doing any of the programs, we needed a number, we used an average of a three year payback --

Q. Mr. Burke, a minute ago you told me you have changed your view. As you have studied you have realized--

A. That's correct.

Q. --there are more programs that need help where they had less than three year paybay because of split incentives, what have you, you have adjusted your view of how far you will go with incentives.

A. We have increased the potential induced in the last two years. That's on the record.

Q. Doesn't that make it clear that when you struck the plan before you changed your view, you had assumed that was in the natural EEI in your load forecast. And you have now said, I guess it won't happen in there, we have to induce it.

A. Well, I guess I am trying to make the point that the original --

Q. Could you answer my question first. You can make your point but could you answer my

question.

MR. B. CAMPBELL: With respect, Mr. Chairman, these matters are sometimes not amenable to the kind of simplistic view that Mr. Poch is taking, and the witness is attempting to explain and, with respect, I think he is quite entitled to do so.

THE CHAIRMAN: Programs you can start by answering the question about the natural EEI that you included in your forecast back in 1989. I think that's what he wants.

MR. BURKE: The basic load forecast includes natural EEI as we have said. What really matters is what measures were screened out of the potential induced analysis because of the three year payback issue.

I am suggesting that, on average, three year payback is still appropriate, but in specific instances we have made much more sensible accommodation for what we now know to be market realities. That there are some segments that we might have been too harsh on a few years ago and some segments we were not harsh enough.

MR. D. POCH: Q. So, you saying you have learned a lot about this but it just happens to average all out so that you don't have to adjust your natural

EEI forecast.

MR. BURKE: A. I think you are being very demanding of how precise we can be about this, and I think that it's not possible to make strict statements about what was included and what was excluded. Each year we do the best we can at estimating what the basic load forecast is going to be, and we do the best job we can of screening measures that are either eligible for inducement or not and come up with a forecast of potential induced.

The amount of potential induced has increased substantially in the last two years; the year 2000 target has not. That's a separate issue as far as I am concerned. It's not a question that is related to this issue of whether we have screened out measures at the bottom end and in some way biased potential numbers.

We have made the estimate of 2000 in 2000 now with the higher potential induced value, so it's not a question that somehow these two are inconsistent. We have re-visited both numbers at the same time. We are not stuck with the old 2000 number when we had 4500 megawatts of potential and then we said we will leave that the same, even though potential induced is 6400. We have had the opportunity to consider whether we

should have raised the 2000 number and we have not done that. And that is for reasons completely perhaps different from the screening question that you are now asking.

Q. You have just told me that you have raised your estimate of economic potential significantly since the plan was struck with 2000 for 2000.

A. That's in the evidence.

Q. Yes. And you have said you haven't raised your target?

A. That has been in the evidence too.

Q. Yes.

Ms. Fraser, on numerous points you have said it might help to raise incentives if you know you aren't at the optimal take-up rate yet. You don't always know that. You may be. When you were answering Ms. Couban you talked about not wanting to waste resources giving money away on incentives that you didn't need to.

MS. FRASER: A. That's right. The money might be better spent doing something with respect to the barriers, doing things with respect to information, doing things with respect to technical risk that just the incentives alone aren't it. If we blow the whole

bundle on incentives, we haven't got anything left for the other barriers that we have to deal with.

Q. Is that your principal concern with paying too much on incentives?

A. That's one of my concerns. I think we have talked a bit about other concerns. I talked yesterday about the lighting industry and their concern with respect to distortion of competition in the marketplace.

Q. But we agreed you could solve that with a program which offered those incentives to a variety -- at least one of those problems offered to a variety of manufacturers. Anybody who met a particular performance?

A. That's not the competition issue I was talking about. The issue in terms of contractors bidding on particular jobs where it is not just the product per se that they were installing, they all could be installing exactly the same product. But the fact that one could go in and do a better lighting design or one can go in and do just more value-added service in doing different things that they should be allowed to compete on those things rather than just here is Hydro paying for the job.

Q. And you could offer incentives based

on what level they attain in that case too?

A. Well, that's the customized incentive level.

Q. Can you carry on. What other concerns do you have about going too far with incentives?

A. I would say that one of my other concerns has to be, well, we have talked a bit about the equity but when I look at some of the savings that some of our, for instance, some of our industrial customers are going to be making, I talked about Carleton University the other day and the $200,000 a year energy bill savings.

We have situations where UCAR Carbon Canada, formerly Union Carbide, their project is going to net them $850,000 a year in savings. I guess I just think that it's appropriate for them to put in a piece of that action.

Q. If they don't do that or if they don't go far enough, we are all losers, we agreed on that, didn't we?

A. If. But obviously they haven't because the project has gone ahead.

Q. And you would agree that -- in fact if you turn up the balance of power, page 3, Exhibit 3,

rather, page 6-5. Page 6-5 in the middle of the column there it says:

> Because incentives and changes in revenue are transfers of money between Hydro and its customers, they do not affect the total of the customers and Hydro's costs.

So, paying more than you may need to, while it may give rise to this equity concern that we have spoken of, it is not a waste of resources, is it? It is just a transfer.

A. It may not be a waste of resources but it may be a redistribution of income that may not lead to the most efficient allocation of resources to achieve the goals that we want. And if --

Q. But can't you --

THE CHAIRMAN: Let her finish.

MS. FRASER: And as long as there are other barriers in the marketplace. And quite frankly, I think the non-financial barriers are far more perverse, far more pervasive than the financial ones. The financial ones I think we can handle. And where we have to put the money to it, I think we have demonstrated that we are putting the money to it.

But it's cracking those others. I will

give you -- I hate picking on the City of Toronto, but I will give you another City of Toronto example. We have tested window film down at City Hall. We had some energy savings. The comfort in the floors that had window film on them improved. But no, we couldn't install window film at City Hall because it would jeopardize the architectural integrity of that building. Now how do you deal with that kind of a barrier?

MR. D. POCH: Q. Didn't we just finish a long discussion yesterday afternoon where we went through all kinds of these barriers, many of which weren't first costs or the economic one, and we agreed that if Hydro either paid high incentives, paid for the measure, or actually installed the measure itself, bought the thing itself --

MS. FRASER: A. Do you think if I could took my roll of window film and went down to City Hall, they would let me in?

Q. It's not going to help in every case but you agreed in many cases that would help; right?

A. I agreed that that was part of the answer, but there are still lots of other things we have to work through?

Q. Fine. I am not saying you shouldn't.

I am just asking you what's wrong, what are you afraid of in terms of paying too much on the incentive front or buying too much of this yourself? Where is the waste? Where is the lost economics? Where is the lost resources? Why couldn't you do those other things to overcome those other barriers too?

A. Well, because you will end up cream skimming, first of all, because if you are paying too much, then obviously you are paying more than is required and there may be other things that are more expensive and more valuable that you should be paying just that much to get. I think it's a whole balancing act.

Q. Haven't we agreed you will go after everything that is cost-effective though?

A. Yes.

Q. It's not going to mean because you go after one you don't go after the other.

A. But getting everthing that is cost-effective doesn't mean blowing the whole bundle on incentives--

Q. I guess I don't understand --

THE CHAIRMAN: Let her finish.

MS. FRASER: --particularly when we don't have enough information at this point. And from what I

have seen in terms of U.S. utility studies, as well, even some that have been in this business for ten years, that I don't think there is enough information to statistically quantify the relationship just between dollar incentives and penetration. For instance, it was sort of a major revelation for PG&E who have been doing demand side management for about ten years that program take-up became -- what was more important than incentives was having the trade allies involved.

We didn't start out this business without the trade allies involved. We didn't develop our first program which was lighting without having the manufacturers consulting contractors, distributors involved.

I agree that we don't have all the answers and I wish we had all of that kind of statistical analysis and I could just, you know, pull a number out of a hat and say well, that one is perfect, or pull it out of a a computer program and say that's the perfect incentive.

But we can't and we are learning and we are fine tuning and I think we have demonstrated a lot flexibility and I think we are dedicated to getting all we can do, and I think it is really important not to look at this as a one-shot opportunity.

MR. D. POCH: Q. Well, Ms. Fraser, I think we had discussed with Ms. Mitchell a few minutes ago how it is not a one-shot opportunity, but in terms of timeliness and in terms of economies to be achieved in multi-measure programs, there is a lost opportunity. We had agreed to that.

MS. FRASER: A. Very important. I think that's designing, that's part of program design, and I am not saying that everything we have ever done is perfect and that's why we have developed flexibility and the ability to fine-tune our programs.

THE CHAIRMAN: Perhaps you can help me for just a moment. Why would it not be good strategy on your part to pay more for incentives than you might otherwise think you should just to see what happened, how it would work and whether you would pick up more than you perhaps thought you might.

MS. FRASER: That's exactly what we are testing in the Espanola project, the community conservation project where we are paying virtually 100 per cent to see what kind of take-up that we get in that kind of a situation and to see if the savings that come through that approach as opposed to a different approach that we are using on a broad-based market approach is making a difference.

THE CHAIRMAN: I guess what Mr. Poch may want to know or perhaps I would be interested in is why wouldn't you do this any way, if given all the other principles that you have been discussing, why wouldn't you do this anyway because all you have got to lose is that you.... Well, what have you got to lose?

MS. FRASER: Well, I think the critical thing is that the incentive, the dollar per kilowatt or the dollar per measure that's paid is only really -- that dollar transfer is only one part of the incentive.

...

[10:50 a.m.] As you indicated in terms of our electrotechnology transfer, that can be considered an incentive.

Well, we do lots of research in terms of energy efficient products and standards, we do lots of building of the infrastructure and training.

We are launching a major program to train the Ontario Electrical League contractors so they can do lighting retrofits. Doing a lighting retrofit is not as simple as just taking one bulb out and screwing another one in. Lighting is truly absolutely an art form, it's not a science, you can't quantify everything.

Building the infrastructure for R2000 builders, that's something that the federal government has been working on for what, ten, fifteen years, and we still have very few certified builders in Ontario, and if we are going to set a standard for R2000, or if the Ministry of Energy is going to set a standard for R2000, the Ministry of Housing, you can say that's the standard but if nobody knows how to build it, I think we have got a problem. Part of the cost of moving to those higher efficient kinds of things are those sorts of costs relative to training, infrastructure development, retooling of industry.

Part of the Power Corporation Act changes that were announced in July is going to allow us to do some financing on those sorts of things as well, and that there are other costs in addition to actually just paying for the cost and if we, you know, as I say, blow the whole bundle on the incentive dollars that pass between Ontario Hydro and a customer, then I think we have a problem, particularly when we are not sure it's required.

And from what we are seeing in terms of the take-up of our program, right now this year we are tracking above target and, as I said, if we can get to a stage next year, five years from now, seven years from now where we can get more than 2,000 megawatts by the year 2000, believe me, that kind of flexibility is built into the balance of power plan and I think Mr. Shalaby can talk better about how that flexibility flows into the plan.

MR. D. POCH: Q. Ms. Fraser, I've never suggested you shouldn't do these other very laudible efforts to get through other barriers, and you have given us many examples, and I guess the difficulty I'm having is understanding why you keep referring to ways to blow the bundle; why can't you do both, if it's not eating up resources --

MS. FRASER: A. Yes, and that's exactly what we are doing right now, is doing both, but you can't just say -- and that's probably a good reason why we don't put the incentive calculations in the total customer cost test because it's not just the incentives that make the difference.

Out of that total customer cost test you have got to include all those other costs or else you are actually making that item cost a lot more.

That if you haven't -- you know, in some ways just including the incremental cost of the equipment, assuming that someone's trained to do it and assuming all those other things, when that's not the case is really maybe an overstatement of the potential in some ways.

Q. Again, I'm not disagreeing you should also worry about getting it installed and worry about giving information transfer and perhaps install it yourself or hire someone to install it.

A. And those things all cost money, right?

Q. Absolutely.

THE CHAIRMAN: Could you wait until he finishes.

MS. FRASER: Okay, sorry.

MR. D. POCH: Q. Those things all cost money, but when we are talking about something like commercial lighting where your program, say, it's 2 cents and your avoided cost is 4 cents, and whether or not you give 100 per cent incentive, you are going to incur the costs to get it in place, you are going to do all those other things you tell us you are going to do and the piece of technology will be bought, the money is going to be spent and you have still determined that it's going to come in at less than 4 cents, the incentives don't add to that - we have agreed on that, it's just a transfer - why wouldn't you go overboard on the incentives to be sure to get it. Because, after all, if you don't get it we are, for sure, going to pay for more expensive supply and that will cost; right?

MS. FRASER: A. I don't think we have enough information at this point in time to say, with the kind of assuredness that you seem to be saying, that higher incentives will get it all.

I think we have got a lot more effort to essentially crack the marketplace.

THE CHAIRMAN: But it might get more?

MS. FRASER: It might get more, and believe me, every time we identify an opportunity where it might get more we will do so, and that's why we -- I

mean, I think that we have essentially taken the lid off programs, doing things like non-profit housing program which pays 100 per cent of the project costs. So, we are moving to 100 per cent cost for new construction and paying all those things in addition to training engineers, in addition to paying feasibility costs to help them design those things. Those are all in addition to that, in addition to the incentive.

MR. D. POCH: Q. All right. Wouldn't you agree it makes sense to err on the high side? Since there's no waste here, it's just a question of you spending the money rather than the customer, wouldn't you agree it makes sense to err on the high side because if you happen to undershoot it or lose an opportunity, we'll for sure have to pay more on the supply side?

MS. FRASER: A. Yes, and I think there are lots of places where we are erring on the high side.

MR. SHALABY: A. Now that you mention supply side, that's my cue to come in. I want to add -- direct answer perhaps to the Chairman's question, why don't you pay a lot more incentive, that's your question as well.

The issues here are raising the price of

electricity. The more incentives you pay, the more the price of electricity will go up.

Secondly, the issues of equity would be pushed even further, the non-participating customer would pay more and more for the participating customer.

So, it's a question of judgment and balance here. If you don't need to pay very high incentives, you are balancing the issue of getting higher penetration, higher acceptance against the issue of rising electricity prices and pushing the equity issue -- those are the two things that you are balancing.

Q. All right, Mr. Shalaby --

A. If equity and price of electricity were no issues at all, then going full incentives would be the way.

Q. So, you'd agree then that to the extent -- but to the extent you undershoot because of this concern for equity, definitely we will all pay more in fact for the supply, that's the point; isn't it?

A. Only if you are sure that low incentives are resulting in less that optimum harvest of the demand management, only if you are sure that paying more incentives will get you more.

Ms. Fraser is saying that she's sure that some places that doesn't make very much difference.

Q. Okay.

MS. MITCHELL: A. I would just also like to add from a residential perspective that I think everyone on the panel has pretty much admitted that there is a possibility that raising incentives will deliver more, however, there's also a cost attached to that and, as evidenced by a federal program, the Canadian Home Insulation Program, whereby we paid -- or the government paid substantial incentives for insulation within residential homes.

What resulted from that was an industry that grew at a rate which it shouldn't have grown at, participating contractors were not trained properly and it left a very bad taste in consumers' mouths at the conclusion of that program. We are still suffering from the after effects of that type of implementation of a program.

In consultation with industry in looking at future insulation programs has led us to believe that the infrastructure wants us to take it slow and to make sure that we do it right, and that's the reason why we have programs like the Espanola pilot test so that we can make sure that we don't make mistakes like

that again.

Q. My understanding is that some of the ureaformaldehyde contractors were upset, but do you have evidence that there was customer dissatisfaction? I mean, ultimately there was with UFFI, I have that.

A. I'm not speaking of customer dissatisfaction.

Q. All right.

A. I'm talking about industry.

Q. Okay. Let's just talk about targets then. You have told us you set -- well, actually let's refer to Volume 2 of our materials page 97.

And you say there that:

> Hydro sets its demand management targets based on the maximum amount of the measure that it feels - that it feels - is attainable over the given time frame.

And obviously since this is a new learning game, this feeling isn't based on a lot of hard experience yet; fair?

MS. FRASER: A. Just not quite two years in terms of putting incentives in the market.

Q. All right. And you have already told us that if a program isn't meeting your expectations

you are prepared to raise the incentive and you have in some cases.

A. In quite a few cases. 4.20.45 details that, about eight pages.

Q. Isn't it fair to say that you are going to measure the success of your programs by reference to that target level; that's your yardstick?

A. Yes, each program has a target and we measure against those things. That's good management technique.

Q. And when you set those targets, both for economic potential but for attainable perhaps more importantly, you told us I think in your evidence in chief that you looked around, you saw what other utilities were getting, some of the best of the other utilities programs, mostly in the States?

A. Yes, mostly in the States.

Q. In fact, your information hasn't, from the examples you have given us, been all that good; has it. You told us about street lighting, Bonneville got 25 per cent, you have been able to --

A. 33.

Q. I'm sorry?

A. 33.

Q. 33, all right.

A. In five years, yes.

Q. Let's not beat them down too bad. You figure you'll be getting 90?

A. We got 93 in the pilot and we are currently standing at about 40 per cent for the whole province, for the province-wide program.

Q. You set up a light bulb retailing promotion with Loblaws and you presumably had some idea how well it would do from looking around and it outsold everybody's expectations; right?

MS. MITCHELL: A. Yes.

Q. Now, we have got these targets set a couple of years ago, Mr. Burke's told us he's re-examining them, 2000 by 2000 is a couple of years old, you have told us they were set by looking around, it's a feeling because we don't have a lot of -- especially then we didn't have a lot of hard experience, we are learning that some of that information doesn't apply, you can do much better, but you have also told us that these targets are really the yardstick by which you are measuring program success.

MS. FRASER: A. I also -- oh, sorry.

Q. My question is: If the programs meet the targets, or even if they don't initially and you raise the incentives and you push them towards that

target, but if the targets were too low in the first place in terms of what's truly attainable with an all-out hundred per cent incentives, all this other marketing support approach, is there any reason we can expect Hydro would carry on and raise the incentives further and pursue higher than original targets?

THE CHAIRMAN: You mean incentives or the targets?

MR. D. POCH: The incentives and the marketing efforts to get levels above your targets.

Q. Or will you say: Gee, we are getting near the target, this is great, let's put our effort into this other program over here?

MS. FRASER: A. I think I made it very clear yesterday that if we can get more than 2000 by 2000 that we will, and I think what's also going to take place now with the indication from the government that they're interested in aggressive standards, which is a big change from where they were a year ago plus, because the standards that was first in the Energy Efficiency Act were not in any way aggressive, the fact that we are now fuel switching and all the discussions that we had yesterday in terms of having to net out overlap between fuel switching and energy efficiency potential. There is no doubt that, you know, based on

things that we have learned, based on the changing conditions, based on the change in the regulatory environment and the mandation environment, that all of those things are going to have to be factored in to what we are doing.

If it turns out we can get more than that, I mean obviously we have just raised the target to 3,500. So, yes, we have got more tools in our arsenal and we are willing to put more money against it, and we think we can do it now because we have got the backing of the government.

We are still waiting to see what exactly that means in terms of actual standard levels and we are still waiting to see what that means whether they're going to insist that all new houses have gas or whether they're going to leave it open for Ontario Hydro to try and convince some of the people that want electricity to put gas heating in.

I mean, there's a big difference between that. It's 100 per cent penetration and maybe 23, as Mr. Burke said.

So, we still have to figure out what level of certainty we can put in those numbers and what we can expect in those numbers, but I think Hydro has moved very quickly with the -- you know, we have talked

about 2000 by 2000 only because it's convenient as a reference point for most of our other documents but, you know, now that we have had those other tools we are moved up to 3,500 and, you know...

Q. I hear what you are saying that you are prepared -- you are prepared to, if you are getting this kind of success, to turn to Mr. Burke and say: You better raise your target and change your forecast and the supply guys better recast their avoided cost numbers and run the model again, and time will tell.

A. That's right.

...

[11:05 a.m.] I'm asking you, since the target is in essence the yardstick, the thing you are shooting for, and you have got this concern about resource allocation, won't it be natural that you are going to back off your -- if you are not going to go and push incentives even harder when you are getting near your target, you are going to put your resources in other programs. The target will become the goal, and indeed, didn't you tell us that that target is indeed the yardstick against which your pay incentives are measured?

MR. WILSON: A. Mr. Poch, last year we had a really good year. We are, quite frankly, amazed at how well we did. We exceeded our targets. And 1990 was also the year that these program incentives were increased.

We got into the market, we set ourselves some targets, we achieved more than the targets, and we identified through our experience that we could have -- we could have set even higher targets. And indeed we are doing that. We raised incentives where that was appropriate. I think we are on the record as not being stuck with setting ourselves sort of easy targets and then saying, Well, we can relax if we meet our targets. We are pushing, and we were determined to go past the

target we set, if we could do it, and we did.

Q. Did you raise your incentives in programs where you were achieving your target or surpassing your target, as you said you were pleasantly surprised that you did?

A. Let me ask my colleagues.

MS. FRASER: A. Yes.

Q. Can you give us an example of that?

A. Lighting, savings by design.

Q. And you surpassed your target in 1990, in lighting, savings by design?

A. For lighting, possibly not savings by design. Not, because it is only the way we measure the target. We don't count it in our targets until the equipment is installed and turned on. And obviously in new construction, you can get a commitment one year, and that building doesn't actually get built and commissioned for four years. We don't count it until the fourth year.

Q. So, it is a complicated question.

MR. WILSON: A. And the recession?

MS. FRASER: A. And the recession, didn't help. But just as as example to follow up on Mr. Wilson's point, my targets for this year, when we struck the budget last year for commercial, were

around, in about 50 megawatts. The target is now 80 megawatts, and so we have demonstrated, as he said, that we are quite willing to, you know, if we can get more we will get more. And if it looks like, you know, higher incentives will get us more, we will use that. If it looks like we are going to need more training, we will use that.

Q. So, you have actually been able to raise your targets, your annual targets?

A. Short-term targets, yes.

Q. Mr. Burke, will we be expecting then that the 2000 for 2000 netted, for whatever goes on with fuel switching, what have you, will be going up in the next load forecast then because of what we have just heard?

MR. BURKE: A. I'm going to have to review it very care fully. It is not obvious to me. As I pointed out yesterday, time passes each year - and this is where I get lynched by my fellow panelists - but while the results, and the reason I haven't been wild about increasing my forecast of what would be achieved in the year 2000 -- first of all, it is not my job to set the corporate target, let me make that clear. I just forecast based on the information that is available to me.

Q. Let me interrupt you. I am sorry. Who sets this targets of 2002?

A. I think it was originally set by the chairman and president at the time, and it was included as the forecast of what I thought with we would achieve and what my whole division, who works sort of analyzing demand management and load forecasts thought would be achievable, and they do that in consultation with everybody that is involved in this in the corporation, energy management branch and system planning and so on.

Q. I can help you there, Mr. Burke. I can certainly understand, as a forecaster, how if the corporation hadn't -- if the corporate chairman and president hadn't changed the target, then you as a forecaster wouldn't want to assume otherwise?

A. My concern frankly was whether I should lower my forecast below the target that was set. And the reason I would be concerned about that, and this is the part that is awkward, is that while the energy management branch has, in fact, met its annual targets and exceeded them so far, the mix of programs in that group has, as is indicated in Exhibit 76, not all of the megawatts that are included in those savings are what we call sustained megawatts. That is impact on the year 2000.

Those results are given by sector in Exhibit 76, and indicate that while the performance to date has been very good in terms of savings for this year and last year and so on, that the long-term implications of the nature of the programs that are in place at this point are such that we are going to have to wrap up considerably in areas that have long term sustained benefits in order for the year 2000 implications for sort of long-term planning purposes to be met.

And in fact, my view is that the ramp up of programs is such that even were we to use the assumptions that I have indicated exist in the load forecast document of incentives up to incremental cost in many cases, and up to avoided cost where necessary were used, I don't think we would, in fact, achieve much more than 2000 megawatts in the year 2000. I remain to be convinced of that.

There are a few simple parameters to this. The result that was given in one of the interrogatory responses you used yesterday was that -- one of them was that if -- and this was speculating, but if we had 100 per cent incentives across the Board, we would not achieve more than 75 per cent penetration at the margin. That is, as the penetration rates

cumulate over the years, you certainly would agree that with experience penetration rates will rise through time, as we get better and better at offering programs, and as the programs are more comprehensive in the way they tackle each and every market segment.

If you allow a ramp up to 75 per cent over this decade, I don't see any way that you could average more than 50 per cent of potential on average for the decade. And in practice it's going to take, I think, a lot even to achieve that. So that the estimate we have, which is 30 per cent of the potential this decade, I think is a reasonable one to work with, even under the assumption that we are offering incentives up to incremental cost where appropriate.

I think we have planned on the first few years of the 1990s as being a period in which we learn about demand management through offering programs of various kinds, gain experience, and then starting in about '92, '93, we are in full force. I think that sort of approach is documented in Exhibit 76, and it's at that stage that we would claim to have completely covered the province and that our penetration rates will start to get up to their maximum levels.

From my point of view, effectively we are looking at two-thirds of the decade at full throttle,

and it doesn't surprise me that we don't end up with what I conceive of as the maximum reasonable, attainable rate, which is 50 per cent for the decade, and something like 30 per cent seems most reasonable, even with the full incentive package that you are describing and which I believe is embedded in my forecast numbers.

Q. Ms. Fraser, the Espanola project is based on the Hood River experiment? It is a variant of that?

MS. FRASER: A. Yes, I mean, Hood River has always been cited as here's how you could go and do a full community retrofit. I'd point out that Hood River was not cost-effective.

Q. Right. But for Espanola, you are assuming it will be cost-effective, you are assuming you are going to achieve 80 per cent, right?

A. The program design is cost-effective assuming -- is it--

Q. I am sorry, is this yours, Ms. Mitchell? Is it prominently residential?

MS. MITCHELL: A. It is a cross sector program.

Q. Cross sector; okay, go ahead.

A. I believe the 80 per cent that you

are referring to is the response rate to the actual audits.

Q. All right, what is the attainment rate of economic potential in Espanola you are anticipating from that project?

A. Could we come back to that?

Q. Would you agree with me it is much higher than 30 per cent?

A. Yes.

Q. And would you agree with me that that program is cost-effective, meets the tests?

A. Yes, it does.

Q. Indeed it even meets the distributor RIM test I think, doesn't it?

A. Yes.

MS. FRASER: A. I would just point out that the program design is cost-effective, but that's one thing that we want to see.

Q. Yes.

A. That's one of the things that we are testing, we are right at the edge with that test.

Q. How long will it take to do Espanola?

MS. MITCHELL: A. Approximately a year and a half.

Q. Okay.

MR. BURKE: A. I'd just like to add my little bit here that its certainly including results from Espanola and the idea that one could do projects like that. I still claim the year 2000 number is reasonable, because the rate at which Espanola-like projects can be generalized to the province as a whole is not that rapid.

And while it might be nice to think that one could instantaneously get Espanola-type results, it just won't work that way. And it is that reality check on the development of the infrastructure required to deliver these sorts of intensive programs that yield the higher penetration rate results that puts an effective cap on the rate at which the average penetration rate over the decade can rise.

Q. All right, Mr. Burke, and that -- you really highlighted for us the failure, sort of the poverty of our discussion, if you will, if we continue to focus on the year 2000 as some magic line. And indeed, would you agree that we might better look at, for example, the first date that you could have a nuclear plant up and running, which I understand is now 2007, if we wanted to get an idea of how much conservation we could get in place in the lead time of that supply option.

A. Yes, we certainly have numbers that would go out to 2007.

Q. Ms. Mitchell, you will get back to us on what your current expectation is on the attainment rate for the Espanola project?

MS. MITCHELL: A. Yes, I will.

Q. Thank you.

MR. D. POCH: Mr. Chairman, I'm about to turn to another topic, OM&A. I don't know if you want to take a break now, or I can carry on. It is no problem for me.

THE CHAIRMAN: Well, try to carry on for ten minutes, and then we will take a break.

MR. D. POCH: All right.

Q. Could you take out Exhibit 25 again, at page 15, and can you confirm for me that this energy efficiency plan, which is set out here, which is behind the balance of power, in each case as is indicated by the heading on the second column, you were including in your cost, lifecycle cost estimate you used for cost effectiveness screening--

THE CHAIRMAN: Excuse me, I don't know if this is dealing with load shifting? Is that right?

MR. D. POCH: No, Mr. Chairman, we may have the wrong page. This is page 15 of Exhibit 25.

THE CHAIRMAN: I thought you said page 50.

MR. D. POCH: I am sorry, I didn't enunciate as I might.

THE CHAIRMAN: I'm sorry, it is page 15 is it?

MR. D. POCH: Yes, 1-5.

THE CHAIRMAN: I am sorry.

MR. D. POCH: Q. And as indicated by the top of the second column there in this list of EEI technologies which dates from when you were developing your economic potential, you included admin costs in the lifecycle cost in each and every case?

MR. BURKE: A. Yes.

Q. All right, and Ms. Fraser, I believe it was you who agreed yesterday that at that time, to get some ballpark estimates, both of economic and of attainable, you had assumed $350 a kilowatt as what the delivery costs were. That is the OM&A costs.

...

[11:20 a.m.] I take it that that has now been refined to an assumption of 320 per kilowatt in residential and commercial and 420 per kilowatt in industrial?

MS. FRASER: A. I can't remember the exact numbers.

Q. I can help you with that. It's in our materials, Volume 1 of our materials -- sorry, it is not Volume 1, it is Volume 2, at page 112.

This Interrogatory 4.7.105, begins on page 111 of our exhibit and carries on and you have even included --

A. I believe what's explained there is not that we have changed to a difference, is that there was a difference in numbers that led to the number of 350, but that for simplicity reasons and ballparking it's 350 --

Q. It is the weighted average of those other numbers then?

A. By and large yes, it's close enough.

Q. Close enough.

And you were kind enough to give us even your spread sheets with all the handwritten numbers on them.

A. You wanted the real stuff. You got

it.

Q. And could you just tell us, could you just decipher this a little for us. What kind of costs what kind of tasks are captured in that $350 estimate? Very briefly. I don't need any detail.

A. Sure. When this business plan was put together, all the OM&A costs were included here. At that time, OM&A costs included all the program design costs, so, for instance, all the staff that work on program design in head office, it includes the technical service work that relates to the particular sector, it includes the promotion costs, all the production of materials, the advertising costs, and it includes field delivery costs.

Q. And it includes people such as yourself, all the people who keep all the programs running.

A. It includes Ms. Mitchell and I. At this point in time it doesn't include my colleagues here to my right.

Q. No, I wouldn't expect it to.

Has Hydro broken down these estimates to see to the extent to which they vary with the number of programs or the number of participants in programs or the number of measures stalled in programs?

A. As I did explain yesterday, this was a ballpark number that was extrapolated from the 1990/1994 business plan for use in what became Exhibit 25, demand management in the 1989 Demand/Supply Plan. But when we get to actual programs, we deal with the incremental cost relative to that particular program. So, it's not necessarily a comparable kind of thing.

This reflects all of the assumed programs and all the assumed penetration expected to be achieved in the numbers, in the targets that were included in the 1990/1994 period. And what we did, I believe, was take the latter two or three years because the early costs were so much higher because of the need to lay pipe we didn't think it was necessarily reflective of what the admin costs would be over the long haul

Q. All right. If you could turn back to page 110. We looked at this a moment ago. To put this in some perspective, the average incentive per kilowatt is assumed to be 625 across all. I assume that's dollars per kilowatt, yes?

A. Yes.

Q. Across all the entire program?

A. That's right.

Again that was in the 1989 -- for the first five years.

Q. All right. And we have just pulled together some of the numbers on one page, page 3 of Volume 2, Exhibit 270. You can see we have done some ratios. So, for example that generic OM&A number is the first on the table, the average incentive number is the second. We have given the sources for these. And if you look in the lower half of that first box, you will see the ratio there, OM&A is 56 per cent of the amount, more than half the amount that incentive payments are on average?

MR. B. CAMPBELL: I'm sorry. Could I just understand that. If I understood what Mr. Burke said just a moment ago, the average number is not to the year 2000. I may have misunderstood. But I want to be clear that if we are going to do some multiplication of these things what the time periods are that are associated with them. I am sorry, but I'm just not quite clear from what has been said.

MR. D. POCH: I had thought I had heard Ms. Fraser say they adjusted the 350 down a bit so it wouldn't be not skewed by the higher up front costs.

MR. B. CAMPBELL: Or the incentive number --

MR. D. POCH: All right. Perhaps Mr. Burke should clarify that then.

MR. BURKE: I think it was Ms. Fraser who said that the number applied for the business plan, which was the five years, the first five years.

MS. FRASER: Yes. But that was used to extrapolate for the OM&A.

MR. D. POCH: Q. The 625 came from page 110 and I had just looked on that table and said 625 and up above it says total load saved 2000 megawatts, it is from that I had surmised that that was the average over that time frame.

MS. FRASER: A. Yes, it is. If you are dividing by the total 2,000 megawatts saved, the overall incentive from the identified and unidentified together average the $625 per kilowatt.

Q. Thank you. All right.

And that was at the time when you were assuming there was more unidentified and it would have this 80 per cent incentive rather than the 50 per cent?

A. Yes, it was $900 per kilowatt.

Q. So, indeed our calculation is correct then, the OM&A amounts to more than half, again, the amount that will be spent, is assumed will be spent on incentives in this plan?

A. Well, yes. Except I would go back to what you said the other day in that some of our costs

which are OM&A should also be considered to be incentives as well. And so the things that we were -- the information costs, for instance, which is included in the OM&A at this point, we have now capitalized all those costs so this type of calculation would look quite a bit different.

The time-of-use rates, as Mr. Harper indicated the other day, is essentially a type of incentive and that those costs aren't reflected here either. So, of course this is just the saving, not the shifting, so it's not quite as significant a kind of thing to look at here.

I guess what I am really saying is if you take that $350 number and use it to come up with some kind of a ratio between incentive and what you would like to call admin, I don't necessarily think that that's terribly helpful because we are now, I think, talking in a much more wholistic way about what our costs are and how we categorize those costs.

Q. We will definitely come back to that.

Just to wrap this point up then. The 2000 megawatts by 2000 implies then 700 million in OM&A just by simple multiplication. And I would take it then you would agree that OM&A is about a third, I think it's 35 per cent is the number, of Hydro's total

program outlay, OM&A plus incentives.

A. Those were the assumptions done for the Demand/Supply Plan, that's correct. It's not necessarily what the programs work out to be now.

MR. D. POCH: Mr. Chairman, that would be a good point to break.

THE CHAIRMAN: We will break for fifteen minutes.

---Recess at 11:30 a.m.

---On resuming at 11:51 a.m.

THE CHAIRMAN: Be seated, please. Mr. Poch.

MR. D. POCH: Q. Panel, we just were dealing with page 3 of Exhibit 270, the second volume of our materials. We dealt with the first box on that.

The second box, we have simply done the same for industrial and I would just point out that we have taken the numbers as they were presented in the sources we have cited, but we did note the 1150 incremental capital cost is actually the average across always sectors; correct?

MS. FRASER: A. I'm sorry, I lost the....

MR. WILSON: A. I think that would be right.

Q. And, in fact, in the industrial sector, for example, incremental capital cost is lower? It would presumably on a weighted average basis, it would have to be higher in some other sector if we did it on a sector-specific basis?

THE CHAIRMAN: I'm sorry, what's lower in the industrial sector.

MR. D. POCH: Just pointing out, Mr. Chairman, just cautioning everyone that while these numbers come from Hydro's materials, we have realized they are using average incremental capital costs averaged across all sectors. So, while we have used it, for example, in industrial sector here to get our ratios, if we actually used the industrial capital cost, which is somewhat lower, for example our ratio of OM&A to capital cost, the number would be even higher but presumably it would be lower in some other sector.

THE CHAIRMAN: You are saying that the 1,150 incremental capital cost in the industrial sector is not correct?

MR. D. POCH: I am just cautioning everyone that while that is the number offered by Hydro in its evidence, I just wanted everybody - I don't think anything much turns on it - I just know that people have a tendency to come back to these and puzzle

later that that is the number Hydro gives us. As you can see it again above in the all sectors, it's the average across all sectors. And that, in fact, the industrial number for capital cost would be somewhat lower. I think the witness has agreed to that. Nothing turns on it at this point in my cross, Mr. Chairman, I just wanted to be ever so careful.

MR. WILSON: Mr. Poch, I am having a little trouble relating the source, Exhibit 25, to the data in the industrial table.

MR. D. POCH: Q. All right.

MR. WILSON: A. You are referring to the incremental capital costs of $1150 per kilowatt. In Exhibit 25 on page 19, the comparable information I think is $800.

Q. Yes, in fact --

A. So, I am confused.

Q. You have clarified matters for me even more. We have given a cite to a place where it is broken out across all sectors and you can see there the substance of my warning that in the industrial it is actually lower.

MR. BURKE: A. The part I am having difficulty following is the total in the year 2000. Is that supposed to be 1150 times the number of kilowatts?

Q. The 1150 comes from page 110 of our exhibit, your Interrogatory Response 4.7.105.

A. But the total in the year 2000, that is supposed to be multiplying the dollars per kilowatt times the numbers of kilowatts?

Q. I'm sorry, which line are you referring to?

A. The second line of the industrial where it has 1150 as the cost per kilowatt and then the total in the year 2000 is 2 billion, 300 million.

Q. Yes. Again taking the 1150 from Exhibit 4.7.104, which it was confirmed before the break was for 2000 megawatts by 2000.

A. What I am not understanding then is it says above that it is EEI industrial sector. Industrial sector is not 2000 megawatts. 530 megawatts.

Q. I'm sorry?

A. The industrial sector, at least if we are sticking with Exhibit 25 numbers, is 530 megawatts.

Q. All right. And so the correct number then for total in year 2000?

A. Well, I don't know.

MR. WILSON: A. It would be $800 per kilowatt times 530 megawatts times 1,000 for

adjustment.

MR. SHALABY: A. I guess that would explain my difficulty in finding the industrial sector Hydro outlay exceeding the total.

Q. So, it was $800 per kilowatt, so it would be $800,000 per megawatt times 530 then; is that correct?

MR. BURKE: A. Yes. And you get 424 million.

Q. You get $424 million, okay.

And if we are making that change then, we should change it to $800 there in the incremental capital costs because we are using the actual industrial sector. And the cite I take it can remain the same?

MR. WILSON: A. Yes, that's right.

Q. Then there would be a change below, the percentage would have to change. Where it says OM&A as over incremental capital costs instead of being 36 per cent, it would be just over 50 per cent?

A. That seems reasonable, yes, except the generic of each sector does in fact, I think, when you get down to program design have its own OM&A proportions.

Q. Yes, but we are doing it on a sector

basis and that is the number you have given us for that sector.

MR. BURKE: A. But you are going to have to change line 3 of the table as well and all the ratios would change. The average incentive the way you have done it is a function of line 2.

THE CHAIRMAN: All the figures in column 2 of the industrial sector will have to be changed, won't they?

MR. B. CAMPBELL: It appears to me, Mr. Chairman, that they are all based on 2000 megawatts not on the 530.

MR. D. POCH: Q. Perhaps I should pause then before we do all this mathematics perhaps needlessly and we should all note on our exhibits that those numbers would correspondingly have to change.

But, in fact, all these changes are in the same direction, and the point I was making is that OM&A is a relatively large proportion of the expenditures relative to incentives, relative to capital costs, relative to your total outlay, or relative to the customer cost. It is a significant number here, a significant percentage.

MS. FRASER: A. That's exactly what I was explaining earlier in terms of putting the whole

bundle on incentives. That all of those costs in terms of training and infrastructure development, promotion, communication, information, et cetera, et cetera, all those things to knock the other barriers down, as opposed to just the financial barrier, are critical.

Q. Right. And indeed, it was this kind of assumption about OM&A, you have told us, was used when you were screening economic potential, where you were deciding how much it was going to cost to get conservation, when you were setting your targets and setting your attainable targets as well. Now, is it your evidence that if we were able to increase the measure penetration, perhaps through higher incentives or other program enhancements, OM&A costs -- well, let's leave it at perhaps through higher incentives so that we are not changing OM&A on the other half of the question, would OM&A costs go up by $350 or whatever the appropriate sectoral number is, but an average of $350 per added kilowatt.

A. Well, I think it would depend in terms of some of the costs are what I would say pipeline costs and some of the costs deal specifically with on a -- they are related the number of projects, so I don't think you can make a generalization about that. ...

[12:02 p.m.] Q. All right. But you are saying some of these are kind of up-front, fixed-type costs?

A. Yes, and some of them are sort of per kilowatt costs, and that's why we used a ballpark over the period and, again, this is '89 for the DSP.

I would point out that a lot of our incentives are now higher than the numbers you see in here, and when we actually look at the program and OM&A it's a lot less, plus we have got to the point now where we think we can capitalize a lot of the costs that primarily before were in OM&A.

So, don't equate - although I think we did in our own words equated OM&A and admin as if admin was some kind of an overhead, some kind of a burden or whatever - that's not necessarily so, I think.

Q. I understand what you are saying. Some of it is variable by the number of programs or the intensity of programs, and some of it is sort of up-front, fixed?

A. That's right. and some of it, as you characterized it, would actually be called an incentive.

Q. All right. And suppose Hydro expanded the measures eligible within a given comprehensive program, you paid the same incentives,

you used the same structure program, delivery and all the rest, you just added more measures, when you are in the home you offered to do two more things than the six or however many you are doing.

A. But by definition our comprehensive programs, particularly accelerated paybacks, savings by design, guaranteed energy performance program, I can't add any measures to those because they include them all.

Q. Well, Ms. Mitchell, I was just referring to the residential example, I think it's called the power savers audit or some such thing, where you do install some and you leave some behind and you give some advice and so on.

If you offered more measures, would it be your evidence that the OM&A would go up by $350 per added kilowatt you obtained?

MS. MITCHELL: A. I don't think we have --

THE CHAIRMAN: Well, first of all, as I understand it, $350 is the 1989 figure, there's a different figure today; is that right?

MR. D. POCH: Mr. Chairman, the two figures I had offered, 320 and 420, were simply the disaggregation of the average of 350 into what they are

in the residential.

THE CHAIRMAN: Well, I thought, perhaps wrongly, that those are 1989 figures. There may be different figures today.

MS. FRASER: They were numbers created in 1989 based on the 1990-94 business plan. At this point in time for overall planning purposes for ballparking the costs to the year 2000 we have not changed that number, when we actually do a specific program we look at the particular incremental program costs relative to it, which may actually not include all of the so-called pipe laying costs.

MR. D. POCH: Q. Yes. And that's been very helpful because I would like to focus on what the assumptions were in setting the plan and are for planning purposes, as opposed to what you find out on any given program, and we'll come to that in a few minutes.

So, if we went back to those intersecting curves, that whole question of providing the balance of power, if you had overestimated the OM&A per kilowatt significantly, then we may have unduly relied on supply and we will have a sub-optimal plan, a more expensive plan, we'll be relying on more expensive supply?

MS. FRASER: A. That's true and if we've

underestimated it, it's the other way around and that's why I point out that just in incentives alone, a lot of our incentives are past the average used here.

Q. All right. And to put a little more reality into this, let's first of all start by talking about some of the costs that are captured in this OM&A and, first of all, there would be general marketing.

Now, you gave us a list and I would like to go through my little list which mirrors yours and ask you questions.

General marketing, you would be informing customers about a program and attracting interest; right?

A. That's right.

Q. You would agree that that is a cost that is incurred for a given program such as this power audit program, no matter how many customers ultimately bite and participate or how many measures within that program those customers ultimately agree to install?

A. Not necessarily. Some of our -- we use sort of staged literature; some literature is to get initial interest, some literature is to inform customers about options, and some literature is to inform customers and other allies about the particulars, and obviously the degree of take-up of a

program requires, therefore, that we produce more material to follow through on that awareness, interest, readiness kind of curve for marketing. And so those costs would follow that kind of curve as well.

Q. You may be jumping ahead a bit. I have sort of disaggregated a bit more, I was talking about the general marketing where you are just going out there initially to --

THE CHAIRMAN: I'm not entirely sure what this is all about.

They have a ballpark estimate of OM&A for planning purposes and when they come to a specific plan or program they make some calculations based on expectations and one thing or another and, of course, if their program is more successful they will have more costs and if it is less successful, they may have who knows, but I'm not quite sure what we're getting at here.

Certainly OM&A is a significant part, as you might expect, of program costs. That doesn't, speaking for myself, surprise me very much. And also I would assume that it doesn't go up in a regular fashion, there's some costs that apply to the program no matter how many units are taken up and some that are a function of what the volume of uptake is, so...

MR. D. POCH: Mr. Chairman, I think I can help you then. I'll tell you where I'm headed.

The $350 we've been told is what was used for the screening for setting that target. It's our submission that if that was a gross overestimate, then they will have assumed conservation is more expensive, significantly more expensive -- we heard Mr. Shalaby talk about --

THE CHAIRMAN: They agree to, they've agreed to that.

MR. D. POCH: Yes, and we heard Mr. Shalaby talk about the 350 being almost, you know, the quarter price of a nuclear plant, just the OM&A.

What I propose to do now is to show how OM&A is made up of a number of steps, most of which you have to pay, or pay significantly for just to get in the door and get a customer involved and that, indeed, for the marginal measures these OM&A costs are not appropriate to be used, we're at a marginal OM&A level which is much less lower than 350 - I will point to Hydro's own programs to demonstrate that - dramatically lower than 350 and, thus, they set their targets, they screened out measures by using a much, much too high average OM&A assumption.

So, I was just going to go through and

just enumerate the kind of expenses that are captured and then we were going to look at Hydro's actual programs and see how, indeed in their own programs - and we may be able to shorten this up somewhat now - they have been getting OM&A when they bundle them properly, on an average basis much lower, and on a marginal basis, even lower still.

THE CHAIRMAN: Well, I don't know if they agree with the second part of what you were saying but you might ask them, in a general way, about the first part of what you were saying and see what their response is, because that may save you some time in going through the specific programs.

DR. CONNELL: Mr. Chairman, I wonder if the concept of fixed and variable costs would be useful here. Any program obviously has fixed and variable costs. It may well be that the panel has some overall impression of what are the fixed costs associated with the demand management program.

MR. D. POCH: Q. I don't know. Ms. Fraser, Ms. Mitchell, you may want to respond to Dr. Connell's inquiry first.

MS. FRASER: A. I would say that probably both fixed and variable costs end up with degrees at each end of them, first of all.

But, for instance, I used the example of training contractors to build R2000 houses. In order to build one house you have to at least train one contractor, however, in order to have a whole industry and a standard based on R2000 you have to train every housing contractor in the province.

So, you can say that the cost of training R2000 contractors, if we want all the houses to be built to R2000, is a fixed cost for that program.

Q. Now, that I understand is in a sense, R2000, we can call it a single measure, although it's a very complicated measure program.

When we look at a multi-measure program like savings by design or power savers audits, would you agree that there's a difference between average OM&A and between fixed OM&A - just to get in the door - and marginal OM&A or variable for adding yet another measure?

Ms. Mitchell, could you -- I think the power savers audit is probably the cleanest one to look at.

Or, Ms. Fraser, if you would to answer, go ahead.

A. See, this is where it gets very difficult to sort out OM&A versus capital. Our audit

costs we are expensing because we cannot clearly delineate or clearly link up a saving from an audit because, as I explained, that the audits are really just a way of identifying savings, they don't make them happen necessarily with actual things that happen.

Yet in every case -- not in every case, but in many cases - and I explained in my direct and so did Ms. Mitchell - that the audit program becomes a front end to all of these programs.

So, just talking about the audit portion of the home tune-up you are dealing with an OM&A. You know, some utilities have only gone as far as done audits, in which case we would be talking about totally fixed costs with no kilowatts at all to save, so we would be dividing by zero, so...

Q. Let's try to simplify this a bit then. First of all --

A. Yes. I think the issue that you were getting to having to do with screening out measures Mr. Burke spoke to both in his direct and cross with Ms. Couban, that there weren't a lot of measures at the upper end that got dropped off and whether we added a bit more or a bit less and, you know...

Q. Well, first of all --

A. Particulary in Exhibit 76.

Q. Mr. Shalaby, Mr. Burke, you'd agree that for planning purposes, for system expansion purposes, we should be looking at system expansion costs on a marginal basis not on a total -- on an average accounting basis. That's how you do it on the supply side; right?

MR. SHALABY: A. Yes.

Q. And let's just look then at the kind of differences we can get. Savings by design example, this is a program aimed, as you've described it, comprehensive savings especially in new construction but there's a retrofit side of it too?

MS. FRASER: A. Yes, retrofit, renovations, the whole gamit.

Q. All right. That's box C on our page 3 summary and we can go through quickly to see where those numbers come from, but perhaps you can just save us a little time and confirm that that sounds about right. You are getting OM&A down to $65.

A. Yes. I haven't redone the math here, but that's...

Q. All right. As compared to the 350 generic assumption for screening and planning purposes, that's like -- 350 is five times that.

A. Yes. What's not included in the

savings by design costs for that particular program are the costs of the commercial/industrial audit program which can front a savings by design project.

Q. All right.

A. So, we've got apples and oranges here, really.

Q. If you add another measure to savings by design it's not going to change that cost?

A. No. What I explained earlier was the total cost of audits--

Q. I understand.

A. --even in our changed is OM&A.

Q. But when we're getting near 2000 for 2000 we're looking at marginal measures and we're talking about adding another measure which is on the line, might trip over the total customer cost test, adding that measure to savings by design won't increase those audit costs and so on, in fact, even the average savings by design cost of $65 per kilowatthour would overstate it for that one; wouldn't it?

...

[12:16 p.m.] A. Yes, as a matter of fact, what would happen in a savings by design project, because we look at the total savings, and we do a total billing energy simulation of the bundle of savings that can be put into that building, and we then take that and determine the load shape of those savings, and then go back, and for each major savings by design project, we do actual and avoided cost run to see what that is. As long as that whole project passes that barrier, we go ahead with it.

So, those marginal ones that you want to add that you think we have somehow missed are in there.

Q. All right, let's go to--

A. Some of the marginal ones that you might be talking about are lights in the closet that don't get turned on very often.

Q. You wouldn't do that if it wasn't cost effective.

A. We'd go ahead and do that in the program. It is not included in the potential numbers. But, I mean there is a whole issue here of, gee, we don't want the maintenance people to now stock two types of lamps. There are certain customer practicalities and realities to it, and then we make that happen in the program.

Q. Let's look at your actual results. Can you turn in Volume 1 of our materials to page 108? I shouldn't say results, but changes you have made. And the first page there, this is from the PCRD.

A. Sorry, I missed it.

Q. Page 108 of our Volume 1, Exhibit 269.

A. Yes.

Q. This was the savings by design program we were speaking of, and it shows at the bottom there, if you take the OM&A, in terms of on a project basis, instead of on a megawatt basis, you had 108 projects, and it was going to be just about $51,000 a project? Bottom line there.

A. Yes.

Q. You have since expanded that program, a larger number of programs. Turn the page over, page 109. Now with more projects, the number has fallen to $17,000 a project, about a third.

A. Correct.

Q. So, in fact, we could lower our $65 number down to about 20-odd dollars as this point, as opposed to the 350?

A. Yes, we built in some streamlining features. We don't require all the small projects to

do a building energy simulation, we don't require them all to have a consulting engineer.

Q. So, now we are talking a difference between, for this project, program, one of your better and more efficient programs admittedly, $20-$25 a kilowatt OM&A, compared to the number used across the board for screening of 350. That difference, $325 a kilowatt, Mr. Shalaby, can you help us, that is a large proportion of the cost of the competition, wouldn't you say? It might be the quarter of a cost of a nuclear plant construction?

MR. SHALABY: A. The simplistic comparison has always got limitations. Lifecycle cost in a levelized unit energy cost is a more appropriate comparison. But if you want to say that several hundred dollars a kilowatt is a significant cost, I agree with that.

Q. So, if there are measures out there that could be tacked on the end of one of these comprehensive programs they could be significantly higher than the cut-off point, screening cut-off point.

MR. B. CAMPBELL: Mr. Chairman, I want to come back to the point that you asked Mr. Poch about, and that I thought the witnesses had responded to. Ms. Fraser said it several times, Mr. Burke has said it

several times. In fact, what they have testified to, and the evidence is, that higher cost measures have not fallen off the table as a result of the kind of screening that these people have done at the planning stage, and certainly not at the program stage.

Now, if that is so, isn't that the answer to where Mr. Poch said he was going? If it isn't, I don't quite understand why. I think he's already got his answer in this whole area.

MR. D. POCH: Mr. Chairman, perhaps I could just make some submissions on that.

First of all, needless to say, we don't accept Mr. Burke's evidence on that, and we hope to present evidence to the contrary.

Second of all, the evidence so far from Hydro's own mouths indicate that that is not entirely clear. Mr. Burke spoke of air conditioner examples which he just presumed wouldn't make it, we have examples of technologies on the drawing boards even a year and a half away, and they are still not in there, and Mr. Burke himself said it may be that these technologies are emerging. And indeed, I could test this further, Mr. Chairman, and I propose to in a few moments.

We are not taking issue with the fact

that -- for the purpose of this point, it is not a question of whether Hydro is or is not learning to do these things better. It is a question of what was used, what was presumed when they did their screening, and set the numbers which are being relied upon to support the supply bid.

THE CHAIRMAN: Well, I think they have said that a) these numbers are significant and these programs, and b) that they calculate these numbers with respect to specific programs, and c) that they use a ballpark figure for planning purposes. Maybe there is something else they have said, but that is about what I have so far.

Now, I'm not quite sure I still understand where this is all getting us to. It is d) I guess that there aren't, in their view, and of course you are free to disagree with it, but you are not going to get them to change. There are very few programs that have failed that TCC test. And if they have, they failed by so much that this isn't going to make any difference.

MR. D. POCH: Thank you, Mr. Chairman.

Q. Now we were just talking about, then, these much improved OM&A, much reduced OM&A costs per kilowatt or cost per measure or cost per participant or

whatever, in this kind of bundled savings by design program. You do have a number of single measure programs, Low "E" windows, heat pump programs, showerhead program, commercial occupancy sensor programs, so on.

MS. FRASER: A. Yes, we do.

Q. Would you agree that the cost per kilowatt, when you deliver measures not in a bundled program, goes up significantly?

MS. MITCHELL: A. I would say that you are making some assumptions there, in that all of those particular measures could be delivered by the same channel and could be bundled effectively.

Q. All right, that is precisely what I wanted to hear. So, we could presumably achieve some gains on those measures by bundling them formally, or bundling them informally in terms of the delivery channels relied upon, and gain again, some economies of scale in terms of OM&A.

A. I'm not aware of a heat pump contractor that does air sealing.

Q. You could gain access to the customer through one of your audit programs or your walk through programs, and lever one program with the other, and then promote them together and so on?

A. And that's what we are doing.

Q. Okay. If we add something like dimmable ballasts, is that one expected to be very expensive, or is that expected to meet the total customer cost test, assuming it becomes commercially available in Canada?

MS. FRASER: A. I don't think we have a very good fix on the cost yet, given that it is not commercially available. The last time I spoke to Mr. Lovins, he said it would be available in about a year-and-a-half, two years.

Q. And I take it, Mr. Burke, it is not in your estimate, in your plan, because there is some risk that it might not materialize as fast or as reliably or as cheaply as some would suggest?

MR. BURKE: A. No, that's not the reason. I explained quite clearly in my direct, at least I hope it was clear, that the approach to estimating potential induced is a snapshot approach at today, and that we can take snapshots each year, but that each time we take a snapshot, we should do it based on the technologies for which we have prooven and reliable cost and performance data. And the reason for that was, as I said before, that each year technology will evolve. We recognize that. That in fact the

megawatts we get, may be megawatts gained through the use of dimmable ballasts.

But what may also change at the same time is that T8 costs may fall, and the number of T8 lamps that are installed naturally may rise. Technology does evolve.

So, the net gain due to programs, if we were to look at this two or three years from now, would be, my best guess at this point, roughly what we are indicating today, but not necessarily with the technologies that we are talking about today. We can only talk about the technologies in any concrete terms today that we know the cost and performance of.

Q. But, Mr. Burke, haven't you just told us if it didn't rise, that would be precisely because natural EEI did rise, falling price of the T8, so your supply need would fall?

A. No, the basic load forecast is the basic load forecast. And as I described in my direct, the basic load forecast takes into account the evolution of technology over time. It cannot be explicit about each and every technology that is going to change over time. It is impossible for anybody to do that.

So, the evolution of technology, the fact

that some technologies become natural over time, that is they become cheaper, lower cost as technology evolves and new technologies emerge that are higher costs that also save energy, that evolution is captured in the basic load forecast as part of all of the technologies that change, and all we are doing is at each point in time getting a snapshot of what we can say the potential induced above and beyond the basic load forecast is.

To speculate on individual technologies, in my submission, is a fruitless exercise, because we will never identify all of the individual technologies that are either natural or induced in the future. The best we can do is for planning purposes look at what we can do today and assume, because we cannot do more than assume, that that is a good indicator of what we would find if we looked at this picture five or ten years from now.

Q. Mr. Shalaby, just in terms of the symmetry here with supply, you do include nuclear as one of your options in the supply side, even though admittedly you don't have any hard information on the acceptability or costs of waste disposal, right? That's not a technology which in all its aspects is yet commercially proven on the shelf. Only the first part

of the cycle is, right?

MR. SHALABY: A. There are estimates of what it would cost, yes.

Q. And there are estimates for what dimmable ballasts would cost, too, right?

A. I assume so.

MR. BURKE: A. I don't think they are very good estimates of how they perform in practice or whether they have, in fact, other aspects to them that are unattractive.

Q. I won't take the bait. I won't jump in and talk about nuclear performance.

We are going to move on to OM&A amortization, and we have just been talking about this 350 that is assumed. The 350 that's assumed when you do your screening, you would capture that over the life of the particular measure. So, if we went to the PCRD and saw a levelized number or a number for total costs, customer costs per kilowatthour saved, that's how those OM&A costs were brought in. They would have been amortized over the number of kilowatts that that measure will save over its life?

MR. B. CAMPBELL: Mr. Chairman, I think Ms. Fraser has already testified that the basis for the two numbers is different. That to make a comparison

between the 350 and the program numbers is comparing apples and oranges.

MR. D. POCH: Sorry. Forget the 350.

MR. B. CAMPBELL: She's clear on that.

MR. D. POCH: Forget the 350. I will withdraw it.

Q. The OM&A costs you use for a particular measure in the PCRD, you amortize them over the number of kilowatts or number of years or whatever it is for that measure, and that's how we get this total cost on a per kilowatt basis?

MS. FRASER: A. Well, I think we have got a few accounting concepts mixed up, and it is probably partly because we have changed some of the rules halfway through, and you are looking at, as you can tell, PCRD represents real live documentation that's evolved over time for each program. There is nothing sort of canned in it in terms of presenting it to this group, in terms of recasting what was there.

...

[12:30 p.m.] Q. Let me help you then. When you were doing your planning, back when, setting targets, how did you treat OM&A? Was it spread over the benefits to be gleaned from that measure on average when you were dealing with that?

A. That's essentially why we used the average and used the ballpark and that's how the long-term numbers were extrapolated based on those averages.

Now, if we want to talk about amortization, we have to get back to --

Q. Amortization I have a hunch doesn't affect total customer cost, doesn't affect anything here, that's for the OEB and how fast it goes into rates, okay.

A. Now, what you may be asking about is the concept called levelized costs in terms of the OM&A or the incentive of a measure for that - let's not bother with the differentiation between those two groups - let's just say the cost of a program, no matter what accounts those costs are incurred in.

Now, if those costs are incurred for a measure that has a life of two years, obviously then you have to look at the life cycle of those costs over that two-year period. If it's a ten year period or if

it's twenty-five years or whatever, so that's why it is very difficult to make comparisons between program to program, and say, oh, well, this one gets so much per kilowatt, that one gets so much per kilowatt, therefore this is more than that one and this one is worth more than that one.

Similarly, it's equally as difficult to make those sorts of simplistic comparisons to the supply side on a per kilowatt basis because of the life cycle, the assumed life of a nuclear plant or a --

Q. We are better off dealing with kilowatthours for that reason, I take it?

A. Yes. Though I find that one hard to deal with myself.

Q. So, let's keep it simple. For planning purposes then, you amortize whatever OM&A you were assuming over the assumed average life of measures then?

A. We averaged it, amortized it --

Q. You spread it out --

A. To hear my accountant --

Q. And for the purpose of your analysis, you attributed it to the kilowatthours that would be saved over the life of the measures assumed?

A. Correct.

Q. Could you turn in our Volume 2 to page 111. It says there that you, in the second paragraph from the bottom, persistence of efficiency improvement is taken into consideration...

Above that in fact it says:

> Once the customer implements the efficiency measure with the advice or assistance of Hydro, he will continue the efficient behaviour over time without the involvement of Hydro.

Now, I am sure I have heard you say, but if necessary you will get involved.

A. Yes.

Q. So, can we say then that in fact though you hope to get benefits due to a sort of second and third generation of light bulb tubes, for example, but that for -- am I right that when you attributed the OM&A, you didn't presume on that, you attributed it over the life of the first generation tube?

A. We attributed, you can use this example in terms of let's say energy saving ballasts -- or energy saving fluorescent tubes which last on the average years.

We did the calculations and this, I think made quite explicit in PCRD, Volume 2 under the

lighting heading, is that although we assumed we would pay for it once and then that behaviour would continue, we also did a check to make sure it was cost effective, even if we had to go back and pay for it each time. Now, in terms of measuring savings, we would only measure those savings once.

Q. I appreciate that.

So, in terms of kilowatt savings, you would only measure them once.

A. Correct.

Q. But in terms of energy savings, it does matter whether you count only one generation or more than one generation; right?

A. Yes. And we assumed in perpetuity that once we showed them what a good idea that was. And that's obviously why we have a higher incentive and we really skew things toward things that we know will continue as opposed to hope.

Q. You have captured that in program design. I am just wondering, when you were planning, when you were doing your planning and when you were doing your screening back when, what was assumed for the life of the measure? One generation? And this is for energy purposes not for power purposes, capacity purposes. For energy purposes, what was assumed? One

generation or that it would persist?

MR. BURKE: A. That it would persist.

Q. All right. Thank you.

Let's go on to programs. First of all, Mr. Burke, we are going to be doing a bit of comparison so I would like to just put this in the context of some discussion we have already had about comparisons.

I have the cites but I won't take you to them. I think you will recall this and be able to confirm. We had a discussion in Panel 1 when we were comparing Ontario -- we were offering a graphic to compare Ontario with other jurisdictions, we were looking at electricity intensity. That, for the record, was Exhibit 107 at page 18.

Ontario's intensity was four times that of the French and Japanese and you found a number of reasons and again for the record your comments appear in Volume 7, starting at page 1288 to 90, for why comparisons were not particularly useful. First of all, you recall that discussion?

A. Yes, I do.

Q. We went on to look at elasticity estimates for a number of jurisdictions. You also found reasons why that wasn't particularly useful. Do you recall that?

A. Well, frankly I don't recall that discussion with you. I remember with other intervenors discussing elasticities.

Q. And finally at Volume 7, page 1303, I asked you about comparing demand management targets between jurisdictions and you agreed that it was for the very reasons we had been talking about on the other subject matters it was difficult to compare what you could learn from technology-specific work that was being done in other jurisdictions and it was only at that level that in your words you could compare likes with likes?

A. Yes, I believe that's correct.

Q. Now let's talk about some comparisons, and I am going to give you the economists' caveat "all other things being equal". I didn't even have to give it to you.

A less efficient utilization device, an end-use measure, will generally, all else being equal, cost less in capital costs than a more efficient device to provide for the same specific service and level of service and so on.

A. I think normally that's the case, but in practice there are all kinds of examples where the more efficient device simply removes features from the

less efficient device.

Q. That's why I said "all else being equal".

A. Okay.

Q. Same level of service?

THE CHAIRMAN: Have you completed your answer.

MR. BURKE: Yes.

MS. FRASER: I might add that the pricing policies of certain manufacturers also come into play here, where they recognize that the energy efficient model is a "premium" model and even though the cost of manufacture is not necessarily that much different, that they will maintain that pricing policy and have asked that that not be changed.

MR. D. POCH: Q. Indeed Mr. Burke, as an economist, you would expect that because there is more value in this product, so the market will cough up more for it; right?

MR. BURKE: A. Yes, but it is quite conceivable that technology will be such that you can really do the same thing with less and it actually costs less.

So, that, as a general principle, I am not sure it holds. I think in the sorts of incremental

improvements to existing technology it tends to apply, but where you just come up with a better mousetrap, it may in the end be just lower cost. It's not inconceivable.

MS. FRASER: A. We can go back to your computer example. I am sure if you bought one today, it would have an automatic feature to shut it off and be much more powerful for the amount of energy.

Q. Let's try to keep this at the level of sort of aggregate, what's happening out there, and I am trying to keep this in very general terms so we don't have to sort of get into debates about the examples of the exception that proves the rule, and I was trying to deal with this just on first principles of economics, Mr. Burke, which is why I have directed the question to you.

MR. B. CAMPBELL: With respect, Mr. Chairman, I think if the witnesses feel that the nature of this is such that they have to add qualifications, it is my submission they are perfectly entitled to do so.

THE CHAIRMAN: I didn't hear Mr. Poch disagreeing with that. But I think he wants to develop the fundamental principles. But certainly the panelists, as they have in all other times, can put any

qualifications they want to after they have answered the question.

MR. D. POCH: Q. Mr. Burke, just then going to first principles and what's recognized, there are lots of exceptions in the real world, and I am sure we will get into some examples. But in running this device, if you are somewhere where you have higher electricity rates if we didn't have barriers at play that were complete in both cases, so all else being equal, you would expect customers to increasingly lead towards efficient options if the electricity that they can save is more pricey.

MR. BURKE: A. Let me just see if I have understood what is all equal here and what is different. All you are asking is: In a jurisdiction where everything is else is the same but the price of electricity is higher, would people tend to buy more efficient equipment? I can agree with that.

Q. Is it fair to say that when you survey utilities, Ontario has been, some would say blessed I am sure, others not, but in any event, Ontario has had relatively lower electricity rates over the years?

A. Ontario has had relatively lower electricity rates than the U.S. as a whole, but one of

the observations I have made in doing the load forecast is that the level of efficiency gain in Ontario seems to not simply reflect our own prices because we are not really the technology developers of North America, we tend to buy technology from other people.

If everybody is using something that is more efficient because their prices are higher, then we tend to acquire these higher efficiency products, even if our prices themselves wouldn't warrant it.

Probably what happens though is that this happens with a bit of a lag. It happens at the point at which economies of scale in those markets have been reached elsewhere, so that the unit costs are more reasonable and then it becomes the generally available technology. We wouldn't have developed it here given our price but we use it here given that it has been developed elsewhere, given other people's prices.

Q. But even with that qualification, now that this is available, where we have got two jurisdictions all else being equal, this technology is available, it is being charged more than for standard, where you have got higher electricity prices, more people are going to partake of it on a first principles basis.

A. Yes, but I guess what I am saying is

that over time, the lower efficiency products will disappear from the market.

Q. Well, we will come back to test that later with some comparisons and in particular in our evidence in-chief.

But you have provided a survey, which is provided as an appendix to Exhibit 25, the RCG/Hagler Bailly survey that you had done for you. Maybe we can turn that up. It's Appendix A to Exhibit 25.

A. These are the excerpts from Exhibit 24?

Q. Yes, that's correct.

This was done back in 1989. I think we should all be cognizant of that in this discussion.

...

[12:48 p.m.] At that time, I take it you would agree, that Duke Power had a target of about 21 per cent at peak for 95 in the year 2000 and the corresponding Hydro targets were shown as 6.8 and 11 per cent.

Does that sound about right?

THE CHAIRMAN: Are you looking at some particular page in that?

MR. D. POCH: Just trying to find that now.

THE CHAIRMAN: Would it be A-15?

MR. D. POCH: Yes, I'm just trying to find the actual numbers there, Mr. Chairman.

Yes, page A-15, Duke Power is the third entry and if you go in the middle box to the fourth column in that middle box it says total per cent of peak 20.7 for Duke Power.

MR. BURKE: That was the result of the survey indicated, but we were quite intrigued by that result because we were surprised how much they were planning to save, so we investigated further and found that, in fact, Duke Power had included what we would call natural results in their estimates and that these were not savings really that could be netted out from a load forecast.

So, in fact, when it came down to how

much they would change their business' usual load forecast on the basis of their conservation programs, they were prepared to make very little change in practice.

So, it's unfortunate about the way the results are reported here but --

MR. D. POCH: Q. Indeed, in fairness to you, Mr. Burke, if you look at the graphic on page A-20 that Duke Power is away out ahead of the rest there presumably because they count differently than the rest; is that right?

MR. BURKE: A. Yes. They've been in business so much longer than most, I think that's legitimate, and they accumulated a lot of natural savings in deriving their number. So, a bit of an outlyer.

We looked into it and, effectively, we don't rely on the estimate in this report for their savings rate.

Q. Right. Mr. Burke, if we just look at page A-17, first of all for 1991, we see there even excluding the outlyers, Hydro's in the middle of the pack at that time, for 1995?

A. Yes.

Q. Would you agree that in the States

it's much more typical for the utilities to be planning with a relatively shorter planning cycle than we're seeing, certainly in this extraordinary case here in Ontario, you can live with my word extraordinary.

These utilities aren't generally planning their demand side management programs in the context of a twenty-five year planning, talking about adding tremendous amounts of supply in the post-2005 period; that's not the way things tend to get done in the private sector, especially in the States?

A. Well, there are a lot of utilities that have integrated resource plans before boards that are of twenty year duration, and a lot of utilities that, for a variety of reasons, did not wish to put forward supply options to their public service commissions for a very long periods -- I'm not sure quite what you're asking, I guess.

Q. All right. Well, let's not pursue it. Can we agree that you can make comparisons of peak megawatt savings across utilities of different size and it would be valid to express the demand management targets in terms of a percentage reduction from peak, so we don't have difficulty with different sizes of utilities, first of all?

A. Well, per cent reduction from peak is

one thing, but -- and you've indicated yourself that it matters a lot where people are starting from, it matters how they account, whether the natural is in there.

There's a whole list of things I could cite for you and, in fact, include quite quickly in my second piece of direct evidence that could account for differences. I mean, you can certainly compare them on a per cent basis, but that doesn't mean they become comparable.

Q. Right. You've done that here, or at least your consultants have done that here, that's what the vertical scale is, peak production in per cent?

A. Yes.

Q. All right. And although this was a study done by - I think it's now MEA's consultants - Hagler, Bailly, it wasn't done internally at Hydro? It was paid for Hydro?

MR. WILSON: A. Yes, Ontario Hydro paid for it, Hagler, Bailly did it.

Q. Right. And is it true that this study doesn't compare energy savings targets compared to projected energy sales levels?

A. The focus of our study was on peak load reduction. Some information was collected on

energy, but that wasn't the primary focus of either our targets or what we asked them to do.

Q. All right. It's a question of what your instructions and the scale of the project were. So, you are agreeing with me it doesn't compare energy, it's looking at peak?

A. Well, we had asked them to look at both the combination of peak load reduction through load management which tends to be peak clipping or load shifting, which has a negligible amount of energy savings as well as conservation programs.

So, we are looking at sort of the total effect and if we focused on comparisons on an energy basis it wouldn't be very useful.

Q. So, you're agreeing with me, you have not included energy there because you were interested in peak effect and load shifting predominantly?

A. That's correct.

Q. All right. And you would agree with me that load shifting is about moving load off-peak predominantly, it's not about saving energy?

A. It makes -- yes, it's about making more efficient use of the power system which is in place by making it more economical to run rather than deciding how big a power system you need.

Q. Right. So, if we are interested in saving energy we shouldn't look at these graphs because they would make Hydro appear to be disproportionately successful to the extent that you have got a lot of load shifting in your estimate. Maybe other utilities do that too, but...

A. Well, sure they do, yes.

Q. But this isn't an indication then of energy savings, per se, although they're embedded in this?

A. It's not an indication of energy savings, right.

Q. And you're not purporting that it should be?

A. No. And you recall that we have a target of 1,000 megawatts of load shifting and 2,000 megawatts of conservation, so roughly one third of shifting and two thirds of conservation.

Q. Okay, that's helpful.

A. Different utilities have different proportions, and I think as the report says, it's a strong shift in the direction of American utilities to prefer load shifting to conservation programs in the late 80s, so that most of the targets they provided are of a load shifting character.

Q. I take it if we wanted to do more meaningful comparisons - I guess would be Mr. Burke's phrase - we would want to break things down by sector, we would want to look at year-by-year megawatt and megawatthour savings from each program, the numbers of participants in different years, the defined eligible population in different years, the year-by-year participation rates, the year-by-year savings per participant, things like that, we'd have to get down to a much finer level and then look at the surrounding context in particular?

MR. BURKE: A. I think it's fair that a much more disaggregated comparison to make sure that other things really are equal would be more valid.

I just want to come back to one thing though. Inside Exhibit 24 there is a distinction made between conservation savings and load management savings, and while my memory may not serve me correctly, my recollection was that, in fact, U.S. utilities tended to have, if anything, more load management as a proportion of peak production--

Q. All right.

A. --than we had. Maybe Mr. Wilson said that, but...

Q. You haven't provided us anywhere with

program-to-program comparisons, I take it?

MS. FRASER: A. With U.S. utilities?

Q. Yes.

A. No, they're also very difficult to do.

Q. I take it that in some informal fashion you did that when you were looking at what kind of attainment -- trying to make your initial estimates of attainment, you told us that you looked around and saw what could be done?

A. Yes, and the consultant's studies are quite thick, they are filed with the PCRD Part III.

We also are a member of NORDAC's database in northeast U.S. and we share data back and forth on those sorts of things as well.

Q. Now, some of the utilities in the comparison group that you've used or your consultants have used in this study have had regulators push them to more DSM since they were interviewed we can safely assume?

A. That's my understanding, yes.

Q. And some entered into collaboratives?

A. That's correct.

Q. So, the goal posts, if you will, have moved since this study was done and your position

compared to the rest of the pack may have changed to the extent that your targets remain the same?

A. Our targets have gone up to 3,500.

Q. I'm sorry. Since this study was done have your energy efficiency improvement targets risen?

A. No, the total.

Q. All right.

A. Yes they have, actually.

Q. And what --

A. Just take out fuel switching and include standards and programs, the energy efficiency improvements have gone up.

Q. And that's assuming these new standards we've heard about?

A. Yes.

Q. All right. But that's not yet been captured in the 2000 -- the 2000 for 2000 hasn't changed, we haven't get captured that, although you've told us now you anticipate--

A. Yes.

Q. --the combined effect?

A. Yes, in terms of something close to scenario C, yes, which I think is somewhere around 2,400 in EEI improvements.

Q. The program based level then hasn't

changed, except to the extent you've had to net some out.

A. Well, we had to net some out, but I think Mr. Wilson made it very clear that in order to both facilitate the implementation of standards and to ensure that standards get the take that's expected of them, that we would be incurring costs which you would characterize as incentives in order to make that happen.

Q. Ms. Fraser, perhaps, you having been in Boston, you can confirm for me, my information, that since this comparison was done a number of utilities have been gone into and produced DSM plans based on the collaborative approach where they get together with various interested parties, and that would include, my information is - and perhaps you can just help me here - I have got Boston Edison, New England Electric, New York State Electricity & Gas, Northeast Utilities, Southern California Edison, Pacific Gas & Electric.

A. I wasn't familiar that New York State Electric & Gas had been involved in the collaborative.

Q. Okay.

A. I believe the New York State regulatory authority has laid some pretty heavy duty targets on the utilities there and provide them

incentives to go for it.

Q. Are you aware that Baltimore Gas & Electric has recently entered into a collaborative design process intended to develop all cost effective conservation programs?

A. No, I haven't heard of that one.

Q. All right. I'm assuming this is not particularly contentious--

A. No.

Q. --and I don't need to go and pull this out. And that Public Service of Colorado has agreed to enter into such a process, I'm told. And that Long Island Lighting and Niagara Mohawk have been subject to regulatory proceedings which direct it to increase its conservation resource acquisition.

Are you aware of that?

A. That's the New York State, right.

Q. Okay. And that currently Metropolitan Edison, Pennsylvania Power & Light and Philadelphia Electric are involved in regulatory proceedings examining adequacy of their plans?

A. I didn't know that. That's good to know.

Q. And that Public Service of Indianna has entered into a stipulation with the consumer

advocate there to increase DSM by 1995?

So, roughly a quarter of the surveyed utilities have committed or have been directed to expand their conservation investment since this survey. Sound about right?

A. I haven't calculated the numbers, but certainly the Northeast and the Southwest are certainly moving.

MR. D. POCH: All right. Mr. Chairman, this would be a good point to pause.

THE CHAIRMAN: All right. We will adjourn until 2:30.

---Luncheon recess at 1:02 p.m.

...

---On resuming at 2:33 p.m.

THE CHAIRMAN: Be seated, please.

I wonder if you could give us some idea of just where you think you are in relation to time of this cross-examination?

MR. D. POCH: I would hope to finish sometime tomorrow, and I did promise Ms. Morrison I'd try to keep her advised. I have a hunch by the break this afternoon we will be in a much better position to judge if there will be time for anyone else.

I just, in fact, had a discussion with Mr. Campbell and the witnesses, and we will see if that has helped speed things along. I couldn't say yet.

THE CHAIRMAN: All right, that is fine. Perhaps at the ends of the day we should discuss about plans for the next ten days or so, because there are a number of factors that are intertwining there.

Mr. Poch?

MR. D. POCH: Thank you, Mr. Chairman.

Q. Panel, we were just talking about all those utilities that were in Hagler, Bailly report, and the fact that a number of them had been pressed or have gone farther since then.

We have pulled out some of them and added one and done a little comparison of five utilities,

which appears in our volume 2 at page 18, and the notes and sources are page 19. United Illuminating is the one that was not in the Hagler sample, although it is in ours.

First of all, as we noted above, you are aware that these utilities' demand management plans have been developed as part of collaborative design processes with non-utility parties?

MS. FRASER: A. You indicated they had. I knew some of them had, but I take it that you would know.

Q. I wouldn't know. I'm told.

A. Okay.

THE CHAIRMAN: Do you understand collaborative to be a technical term of some sort?

MS. FRASER: Yes, I understand the collaborative process, as it applied in the northeast and in California is essentially a process that, I guess, was organized partly by the state regulatory authority, but included a large number of parties who had been intervening with respect to demand side management programs, and they more or less took the process of planning demand side management and some program design off line from the regulatory process, and then to work things out and share data and come

together as sort of a meeting of the minds. That's my understanding of it.

MR. D. POCH: Mr. Chairman, I can just, for the Board's assistance, since this is something I have been briefed on at length and attended conferences on, I understand the process typically leads to both the lawyers meeting the lawyers, and then a lot of experts closeting themselves with experts at various levels. It can be a very brief process or a very lengthy process, and the typical outcome that is sought is a demand management plan or an integrated plan, including supply, where it is very detailed in terms of program design and techniques and so on, and then is offered to the regulator, who may or may not seal it with approval, and that becomes a plan for in some cases one year, in some cases longer periods.

Q. Is that your understanding, Ms. Fraser?

MS. FRASER: A. Yes.

Q. The utilities that are going through that process, and thus these five that we have selected here, tend to be the ones on the sort of the leading edge utilities on demand management efforts. So they wouldn't necessarily be typical or average utilities in the states, the five we have presented here.

A. No, you are right.

Q. We had commented this morning about how the comparison that was presented in the Hagler report is of total peak savings from DSM compared to the projected peak load for a given year.

Would you agree that you can also compare energy in gigawatthours, for example, savings in terms of energy with energy sales, first of all, that is one basis for comparison? Mr. Burke, maybe this is probably more your cup of tea. You can also compare energy. Nothing wrong with that.

MR. BURKE: A. (Inaudible)

MR. WILSON: A. Yes, that is correct.

Q. Again, if we want to segregate out energy efficiency from load shifting and so on, that is the basis to do it?

A. Yes.

Q. We could also, if we wanted to get a picture of how extensively an utility is relying on new energy efficiency initiatives to meet new resource needs, then we could compare the growth in DSM with the growth in energy of demand for a given period using energy?

MR. BURKE: A. I suppose you could. Certainly as far as planning. I think you used that

word, for plan purposes?

Q. No, I was just saying if we wanted to look at a picture of how extensively they are relying or planning to rely, that that would be the full --

A. Okay, I think that's true. Although I think that you certainly would want to do it for a fairly long period of time.

Q. All right. And compared to the approach that was taken in the Hagler report, where you compare the DSM program target to total, in that case it was peak, which would include exsisting peak plus growth in peak, the approach I'm now suggesting would tend to focus attention on the demand management contribution of meeting new resource requirements, at least partially as projected by load growth in the load forecast?

MR. WILSON: A. I think that is one indicator, but its clearly not the most meaningful one. The real question is what fraction of the potential for efficiency improvements are they capturing. If there is a huge stock of inefficient buildings and products, then that is the most relevant base for comparison.

Q. And that was the discussion that I had with Mr. Burke before about all else being equal.

A. That's true.

MR. SHALABY: A. There is one added point, and that is if you consider new requirements, they are not driven just by load growth, they are also driven by retirement of existing facilities.

Q. Fair enough.

A. So, that determines --

Q. I am sorry, that would have to do with need as opposed to what was going to -- the relationship between growth in load, which we have heard presents opportunities, and the EEI, correct?

A. I'm just making a point that if you compare EEI to growth and demand, that doesn't necessarily tell you what percentage EEI is providing in terms of requirements.

Q. In an integrated plan.

A. The requirements are partly driven by growth, partly driven by retirement.

Q. But just in terms of looking at how EEI is filling the need from new growth, Mr. Burke, you've agreed that a lot of the opportunity is because of growth. Opportunity for EEI is because of growth, is it not?

MR. BURKE: A. Not particularly. I think I have indicated most of the opportunities in the existing stock.

Q. It is time sensitive because of the turnover of capital stock?

A. Yes, replacement of equipment and so on.

Q. I had thought I'd understood that the growth in the load forecast is to some extent -- I was correct that I thought yesterday when I suggested that -- I was corrected to understand, at least, that it is the expanding load forecast that it is to some extent, the faster that happens, the more opportunities there are.

A. I think what you were talking about was sensitivity analysis at the time. Would a higher load growth profile mean more opportunity than a median load growth profile? And we agreed that if you're asking where are the opportunities, the division between the existing stock and admittedly its replacement versus the new stock, pure and simple, most of it is in the existing stock.

Q. We have actually, as you have seen, of course by now, done this in table 18, and we have done this for each utility for the time frames that we have information from them as excerpted in materials. And we have done a course -- in each case we have taken the Ontario Hydro numbers for the corresponding set of

years, and to do this correctly, Mr. Burke, if we don't want to make the mistake that was made in the Hagler study you presented with respect to Duke, we'd have to be careful to net out free riders, correct?

A. Yes. I guess the free riders, by that you mean all things that would have otherwise occurred.

Q. I take it free riders are defined as those participants in a program who would or are assumed would have done the measure anyway and are thus already included in the category of natural EEI in the basic load forecast, correct, Ms. Fraser?

MS. FRASER: A. Yes. So, from our point of view it is those who would have done it anyway before the year 2000, not just in the given time frame of the program.

Q. Okay. I don't know if it is necessary to go through this table and take you to where each of those numbers came from. They are in the materials as noted in the sources, and there is the reference on page 19 include cross reference to the background materials.

Mr. Burke, are you comfortable proceeding with these numbers? I don't propose to go into any great deal on these, other than just to point out the

relative scale.

MR. BURKE: A. Let me just check with the other panelists for a minute.

---Discussion off the record.

MR. B. CAMPBELL: Mr. Chairman, perhaps just while the panel is checking this among themselves, Mr. Burke has already indicated that, of course, what is relevant is what the potential is, and I take it, if I read this page correctly, Mr. Poch, there is nothing here that indicates potential.

MR. D. POCH: That is correct, Mr. Chairman. I will be relying on the earlier cross-examination and other evidence for that.

MR. BURKE: Well, I'm not sure that I could claim that we have checked all of the numbers on this table and find them to be correct, but I have checked some of them, and I guess subject to check later on, let's proceed.

MR. D. POCH: Q. Why don't we proceed that way then?

MS. FRASER: A. Could I have one clarification? I don't quite understand where Column 3 came from, and therefore Column 4.

Q. Then briefly I can just tell you what we did was take the projected future demand management,

minus the starting year demand management, which gives you a new demand management after the start year, and we did the same, we did projected future load minus starting year load, which gives you knew load added after the starting year. We are just looking at the changes in the period.

A. This would imply then that Boston Edison only started in 1989?

Q. Yes, that is -- I think--

A. And had 7 gigawatthours in that year?

Q. I think that's right.

A. They have been--

MR. BURKE: A. I have a question about the Ontario Hydro numbers for savings. What is the source for them?

Q. We can take you back there. Oh, yes, and that's another good, important clarification. The numbers here are not the more recent numbers from the PCRD. These are the numbers from the DSP, from Exhibit 25.

A. It seems surprising that you'd choose those numbers, seeing as we indicated our evidence would be based on Exhibit 76.

Q. I am sorry, you may be right, it may be Exhibit 76.

A. I'm not sure that they are Exhibit 76.

Q. Can I just ask, Exhibit 25 is the basis for "The Plan."

A. Well, we have been updating things.

Q. Yes, I understand that.

A. I would think you would find for a year like 1994, that the numbers have changed quite a bit.

Q. Exhibit 25 is behind "The Plan" though.

A. Well --

Q. I hear your point, Mr. Burke, that you are updating these numbers, and I have certainly heard Ms. Fraser on numerous occasions tell us how her programs are going to better those original projections. I grant you that. I accept that.

A. No, no, I think her original targets are being exceeded. These are year by year short-term targets. Whether the long-term numbers change is a different issue. But as far as we can tell here, and Mr. Wilson is doing a little cross comparison, that for the year 1994 or '95, which seems to be fairly significant for you, there is quite a difference in what Ontario Hydro is planning to save. The number is

roughly double now.

Q. Right.

A. Even Exhibit 25? Okay, so we are looking at both exhibits as double.

Q. Let's see if we can get this clarified then, before we proceed.

MR. WILSON: A. Mr. Poch, I have been looking at Exhibit 25 on page 60, just for the energy numbers.

Q. Are you looking at energy efficiency improvement, or are you looking at the total?

A. It really doesn't make any difference.

Q. Well, no, I am sorry, I was trying to be clear here. We are comparing energy efficiency improvement without load shift -- well, you are saying load shifting and passing interruptible load and that don't affect energy.

A. Exactly.

...

[2:48 p.m.] Q. All right. Give me just one moment and I will just see if I can confirm my sources and if I can't we will put this aside for the moment.

Perhaps rather than take hearing time, I will get back to my consultants over the break and see if I can just clarify what the basis for this is so we don't have to sit here and debate this.

Let's just turn then to some specific program questions.

MR. B. CAMPBELL: Just a moment. I don't think you need sort out the numbers, Mr. Poch said.

MR. D. POCH: Q. Ms. Fraser, we spoke of savings by design. It is a, is it fair to call it, a bundled program?

MS. FRASER: A. Comprehensive, yes.

Q. So, it is a program that has many measures within it?

A. Yes. We can undertake any demand or energy saving measure under it.

Q. It is one of the more significant of Hydro's programs, is it fair to say? Both in scale and how well it is performing?

A. Savings by design is big. Lighting, I think will be bigger over time. Probably we are getting more short-term results with lighting. Savings

by design is certainly building up projects that will materialize up over the next two or three years.

Accelerated paybacks is the industrial equivalent of savings by design and it's producing results in its own right very well in addition.

We have just launched the Guaranteed Energy Performance Program, which the Canadian Association of Energy Service Companies has estimated it will take the amount of savings harvested by energy services companies from 1990 level of about 12 megawatts of savings to something between 250 megawatts to 400 megawatts of savings, so that's certainly expected to be significant. There are fifty projects now under consideration, accounting for about 20 megawatts of additional savings.

Q. And focusing on savings by design, it has two paths for participants: performance and prescriptive, can we call them?

A. Yes.

Q. Performance is based on total building energy performance using a comprehensive combination of efficiency measures, whatever it takes to achieve the performance cost effectively under the total customer cost test?

A. What we do there is basically, in

terms of existing buildings, work with the building owners, managers. With respect to new buildings, it is working with the consulting engineering companies in the design community.

What we will do is help them ascertain the benefit of more and more energy efficient options and look at those, compare them against the avoided supply based on that same load profile of savings. You can appreciate the seasonality of some of the savings, particularly the HVAC savings, makes it very difficult to generalize in some cases. And then we proceed on some projects.

Sometimes they don't entertain all of the measures that we have looked at, not necessarily at that time, but they do come back and we have had quite a few, sort of, repeat customers in that program.

Q. That was the performance base. There is a prescriptive approach too where you have just set out some specific efficiency measures where you don't require anybody to go through an assessment?

A. That's right. They are product specific and we right now have a couple of measures along that line. We hope to add some more. This is primarily from the point of view of the product manufacturers.

For all intents and purposes, the window film manufacturers think Hydro has a window film manufacturer, but the consulting engineering community looks at it and sees one comprehensive program because that's what they want to see.

So, we actually have sort of a matrix, if you will, in order to get the window film manufacturers out there selling window film as well as our own field staff working through more comprehensive kinds of things, so we would come at the market from different ways.

Q. In a nutshell then, the prescriptive approach would have -- at present it is a short list of actual sort of approved technologies you are confident that in most cases they will be cost effective. If someone wants these here's what you are offering?

A. Yes, basically how we come up with the ones that we have on there is quite a number of projects using that technology had gone through the screen. We had enough to extrapolate the savings.

Q. All right. And in the former situation, the performance-based path, if you will, it involves a much wider range of efficiency options, not just hardware. It would include design efforts to identify and select combinations and so on?

A. Yes. That side of it is eligible for assistance under the feasibility assistance plan.

Q. As savings by design applies to the new construction sector, you seek to get new buildings to adhere to a higher standard of efficiency than current building practice?

A. Currently in Ontario there is no code for commercial buildings, so current building practice varies all over the place. What we are doing, and we hope to announce the enhancement to the program in January, is to base an incentive on ASHRAE 90.1, which is both a performance and prescriptive-based code developed by the Association of Heating, Refrigeration and Air Conditioning Engineers that has gone through, you know, years and year of consultation and development and refinement.

Q. Just let me interrupt you. That's a code that is actually being proposed to be enacted by way of law, I take it, and indeed I think you in our own evidence said earlier you believe that that would be appropriate in Ontario?

A. Yes, we certainly have made the Ministry of Energy and the Ministry of Housing aware of our interest in having ASHRAE 90.1 become a standard. To date, the Ministry of Energy seems to be interested

in that. We haven't got the quite the same level of interest in the Ministry of Housing who would be the regulatory authority for that code.

Q. I just note in our materials Volume 1, page 57, incentives - this is from the PCRD - and I take it you will recognize this as part of the savings by design description:

> Incentives for new construction are the highest. They will be paid on a per square foot basis for buildings that comply with an energy efficient standard.

And that standard we are talking about is this 90.1.

A. Yes, the ASHRAE standard.

Q. Okay. And savings projected for savings by design are 265 kilowatts or roughly 600,000 kilowatthours per year per project. Have I got that right?

A. That was the average, yes.

Q. Okay.

A. We expect, I think, 51 net megawatts.

Q. Right.

A. Winter peak by 1993.

Q. That would show up if we look at page 61 of the exhibit here. I'm sorry, 60 is the original

program and 61 is the enhanced.

A. Right.

Q. In both cases, in fact, we have highlighted it says 265 kilowatts for the system, 307 kilowatts for the customer each?

A. Yes, that's....

Q. Obviously in the enhanced program it is still 307 kilowatts per customer but there are more customers so the system is going to fair better?

A. Yes.

Q. From the top paragraphs of page 61, I glean that for new construction, the enhanced program assumes two-thirds of participants will be new construction participants - the significance of this is that savings by design also applies to non-new construction and it applies to retrofit, I take it - and that half of those will participate in the standards which I take is the performance approach.

A. Yes, those were assumptions when we got the program re-approved. Since we have proceeded with sort of more intense program design, involving both a market research consultant and an engineering consultant, I would expect that these numbers have been refined slightly and I think we expect most of the new products to go through the standard side and then in

addition have enriched incentives on top of that.

Q. So, in August of '90 at least, you were assuming half of new construction will meet ASHRAE 90.1 standards?

A. Yes. Basically, our analysis of the market - and this is far from a sophisticated one - is that the large downtown office buildings exceed ASHRAE 90.1 quite well already. However, it's that large number of smaller suburban strip offices and those sorts of things which sort of are built to whatever is the favourite colour of glass this year for architects. Those are the ones that are built without much energy efficiency built into them.

Q. Okay. Can we just look at page 49 of the materials. This is from the Boston, the excerpt of materials from the Boston Edison materials.

A. 49?

Q. Page 49 of our Volume 1, Exhibit 269.

Do you see there where we have highlighted that BECo, Boston Edison, will provide a number of means of support, including financial incentives, to produce buildings that are significantly more efficient than those built to the standards of Article 20 of the new Massachusetts building code.

A. Yes.

Q. They are seeking to go significantly past that particular building code?

A. Yes. That's what what I was talking about the enriched incentives to go past the building code. If we had one.

Q. I'm sorry?

A. If we had one in Ontario.

Q. If we had one.

In fact at page 68 it is made clear that the commercial building sections of the revised code - this is in Massachusetts - are based on ASHRAE standards 90.1.

A. The proposed changes are based on 90.1. I believe they are currently operating to the 1977 standards.

Q. But I take it there in page 49, it talks about "built to the standards of Article 20 of the the new Massachusetts building code" so that would be this ASHRAE 90.1?

A. Right. I would also venture to guess that the average building in Boston Edison's territory would relate to the average buildings in downtown Toronto.

Q. Right.

...

[3:04 p.m.] A. They don't have a lot of suburbs in Boston the way we do here.

Q. Can we ask then: When you were doing estimates of economic and attainable potential then, is it reasonable to assume you were looking at a savings by design program that was targeting the 90.1 level for roughly half of those new construction?

A. I think our use of ASHRAE 90.1 is really more a factor of trying to get to a point of having a base case.

One of the deficiencies that we always knew was in the original savings by design program in 1989 was that to do a comparison of the energy efficient option against "a base case", always begged the question: What was the base case, and we had said: Well, it's whatever that developer, consulting engineer was doing before. Well, that, of course, can be subject to interpretation.

So, what we aimed at trying to do was get to a point where we could -- based on our estimates of sort of the average in the marketplace, we could construct an incentive that would say: Okay, to get up to that would be equivalent of so much per square foot which we -- the incremental cost to do that on average would be we figured about $1,000 a kilowatt.

Now, if there were situations where the base building might have been worse than that, then that would have been sort of "their problem" and they would have had to get up to that level to get our incentives and may not have gotten the full difference. However, the fact that we would provide incentives then for people to go beyond that, and such that, if they didn't get up to that level, they couldn't just get a piece of the action, they would have to get up to that level and go past that. So, that's what we were trying to accomplish in savings by design.

I would point out that although the net numbers here are for 51 megawatts by 1993, the numbers that I used in my presentation or my direct evidence on last Wednesday indicated that we had 140 megawatts from the customer side in the pipeline and some will materialize this year, some next year and some in later years, so we're already seeing -- even before we get to that enhanced stage, we're already seeing a higher level of penetration than we expected.

Q. Okay. I'm encouraged.

A. So am I.

Q. So then to the extent that the original plan targets didn't anticipate that, those planned targets, from this factor alone we would expect

it to rise?

A. That's one of the reasons why my 1991 targets are higher than my original budget showed last year. Whether that changes things in the long term yet we haven't enough information to...

Q. We're not talking about anything going on here with these new enhanced savings attainment that you're seeing that aren't cost-effective?

A. No.

Q. All right. Page 62 of the materials, as of November, '90 at the top there we see that there was a funding limit of $300,000. I understand you've since raised that to $500,000?

A. No, the funding limit is gone completely.

Q. Oh, it has.

A. Yes.

Q. Well, that's good to see too.

A. I might point out that Boston Edison's incentive assume that -- not assume, but require for any non-institutional customers that the customer refund the first year's savings back to Boston Edison and that in actual fact the incentives don't get paid to the customer until there are two years of

operation.

Q. Well, that's sort of a verification process.

A. A verification process.

Q. That does diminish the impact presumably of their program?

A. Yes, there is some differences here in operation. It might be something to look at.

Q. All right. Why was there a cap on the program originally?

A. I'm trying to think back to 1988. It seems so long ago.

Q. Do you agree with me --

A. I think a degree of concern had arisen by our Board of Directors, we were not really sure what we were going to -- you know, let's see what happens here, the cap did not stop us from doing anything, as matter of fact the first project that came up against that cap I took up the line and we had it removed at that point. So it was not --

Q. Well, at the time that that's going on and has been going on, you had a program designed to get people to a certain standard, the equivalent of 90.1.

A. That's not in the marketplace yet,

that's an enhancement that's coming out in January.

Savings by design has been in the marketplace, but the calculation of the incentives based on ASHRAE 90.1, as you can appreciate, if you break that down by segment and organize it all, that will be announced January, 1991.

Q. All right. I hadn't understood that.

A. Sorry.

Q. And are you telling me now that that incentive structure allows you to give further incentives to go beyond 90.1?

A. That's right.

Q. Okay, great. What was assumed would be the target level then? Is there any basis to compare what you are getting and what you are now targeting with what was thought you would get and was targeted as part of the original plan?

A. If I understand your question correctly, you're asking: How do we compare the potential numbers that Mr. Burke has talked about with these numbers and what we're achieving?

Q. Well, I was actually more interested in how we compare the attainment numbers that represent the 2000, for example, with what you're achieving and what you now are targeting for with these incentives to

take you past 90.1.

A. I've made a stab at trying to do that and what the difficulty that's inherent there in dealing has to do with that whole issue of replacement and renovation and new construction cycle, building all that in and, frankly, I haven't been able to statistically estimate that yet, but that's something that we're certainly looking at to try and understand where we are.

Obviously, when I do it and I look over the ten year period and see where we are relative to the ten year period, I did that relative to lighting where I believe we've got around 120 megawatts of lighting actually installed or approved and that relates to what we estimate to be 1,000 megawatts of potential.

So, we're somewhere around 12 per cent of that total and, given that -- well, I would have always expected our lighting numbers to be sort of higher than that average 35 per cent penetration that we talked about anyway, but I think we're probably tracking a little bit faster than we originally thought.

Q. Okay.

MR. BURKE: A. I would just like to add at this point, because you seem to be contrasting the

numbers that I used and numbers that Ms. Fraser uses. The penetration estimates for the year 2000 come from Ms. Fraser.

Q. Yes.

A. The potential are numbers that we all agree on in terms of which technology should be in and not in and so on and are added up and calculated by the economics and forecast division, but when it comes to the penetration rates for the year 2000 those are Ms. Fraser's estimates as of last year.

Now, they may change when she comes to do it this year and certainly they changed last year versus the year before and the year before that, so it's not a static exercise.

Q. Okay. Thank you for that clarification and we'll come back to that in a little while.

The other path in the program, the prescriptive path where there's this list of measures, does that only target retrofit customers or does it apply to new construction customers as well?

MS. FRASER: A. Window film only applies to retrofit. Obviously we would prefer the customer to go with a low "E" window rather than window film, but in a retrofit situation that's not always the case.

The ground source heat pump is probably more than likely to be installed on a new construction basis rather than a retrofit basis.

Q. It's not confined to retrofit, is what you're telling me?

A. No.

Q. Some of the measures may not be applicable, but it's not confined to retrofit?

A. That's right.

Q. Just to assist the Board, at page 64 of our materials is that list. So, currently, there are three measure that are on this list.

A. Actually we've had to take the energy efficient unit ventilators for portable classrooms out. This was a situation where we had moved too quickly and not really appreciating all the different models that were on the market and the fact that the savings weren't all the same, and we also have decided to take a more comprehensive approach to portable classrooms in essentially developing what would be the equivalent of an R2000 standard for classrooms rather than dealing with one particular item.

Q. All right.

A. So, that's underway now.

Q. So there are two on the list now,

although I have a hunch obviously the portable classroom technology had a very particular market niche in any event?

A. Yes.

Q. So, these three, now two measures, would have been the basis for making projections of savings per participant or in total from the prescriptive path participants when you made your target estimations?

A. I think we anticipated having other prescriptive ones in. What we have done in the short term is focused on getting that new construction piece in place almost be given the window that the recession gives us to get out ahead of, hopefully, the next construction boom, and so we have focused on that. We will be moving toward getting some additional prescriptive pieces into that program.

Q. An interesting point you raised. Mr. Burke told us in Panel 1 about his view of the self-correcting nature of the economy, and even if we suffer a slowdown now, we will just get a steeper acceleration and the long-term trend will continue, if I've paraphrased you correctly, Mr. Burke.

MR. BURKE: A. Not quite. I certainly didn't say the long-term trend would be the same as the

past. It was based on the long-term fundamentals and those were lower than the past.

Q. So, I take it that this recession that has intervened, as you say, should allow you to get out ahead of the pack and be able to more adequately take advantage of the turnover opportunities that would arise when we get to the economic bounceback phase?

MS. FRASER: A. Well, I think the new construction phase, we found that the recession has had pluses and minuses for energy management programs, that in some ways the fact that, I think, our lighting program has done well is a reflection of the fact that contractors are not installing a lot of lamps in new buildings and so they're out drumming up new business using our program, and so we've had that sort of an advantage in some cases.

Q. It's even better than I suggested then, you can take advantage of this two ways?

A. Well, it goes both ways. The other side of it is that money gets a little tighter.

Q. Sure.

A. We have to look at different ways to do different things.

Q. When money is tighter, I guess the

level of incentives becomes all that much more critical?

A. Yes. And we've increased them.

Q. All right. What did you assume then in making a projection of what the savings will be from prescriptive treatments in the savings by design when you were tallying up your targets? How many measures or what differences did you assume?

I had thought that the reason for inclusion of these on the list were that these were the ones where it was relatively easy to predict the gains to be made?

A. The gains per installation but not necessarily the number of installations. I would have to go back and check my wizards back at the office to see what assumptions they had made.

Q. All right. So that what you're saying is you may not have assumed much more of an extensive list ultimately, but part of your assumption then would have obviously involved guessing how many participant you were going to have?

A. Yes. I think also in terms of prescriptive versus performance, you know, we can certainly handle any of those other things that might not have made the prescriptive list yet under the

performance side of things.

Q. I take it the beauty of the prescriptive approach is that there are a number of projects or project designers that are either fast tracked or enthusiastic enough to get involved in the detailed design work-up with you, so that this is a sort of easy way to get those people to participate?

A. Well, it has that attraction for the customers or for the developers.

Q. Yes.

A. But it also has the added advantage of energizing the allies - the ground source heat pump installers, for example - of, you know, taking the program and they use it in their sales presentations to customers.

...

[3:20 p.m.] Q. Now, can we just take a look at some other programs of other utilities in this regard, and see where you are going with their ideas?

A. I guess I would like to say that the comprehensive program, before we move off Boston Edison's, that program applies to commercial/industrial new and renovation. Their other programs, which were a bit more targeted, more specific, have been subsumed under that program, as I understand it. So they don't have a separate lighting program, they don't have a separate motor program, and they don't have anything that now approaches guaranteed energy performance. Although I think Boston Edison is dealing with some bidding.

Q. So, they are combining more measures which you may offer in other programs into this one program, is that your point?

A. No, I think the point is if you wanted to add up participations and penetrations and all those sorts of things, you would have to look at our--

Q. Yes, I understand.

A. --other programs.

Q. I wasn't going to do that. Thank you for the caution.

You mentioned, for example, energy efficient lighting. If a customer was going for the prescriptive approach in savings by design, and they could go for these two or three technologies that way, if they wanted energy efficient lighting too, that would be a different program?

A. It is isn't as complicated as that. The $500 a kilowatt customer design for lighting is the same as they get under savings by design.

Q. But that is the standard side of savings, the performance side of savings by design, not the prescriptive list?

A. That's right, but we have a performance element in the lighting program.

Q. Lighting isn't included on the prescriptive list in this program?

A. Just in new construction.

Q. If we look at page 37 of our materials, Northeast Utilities, we have highlighted for you there that the --

A. Page 36?

Q. 36 and 37. It starts at 36, at the bottom it says "Prescriptive Area, Customer Incentives," and it goes on. The list is actually embedded in the text of page 37. We see there they

include occupancy sensors and daylighting controls and fixture incentives for exit signs and motors and air conditioners and heat pumps, roof ceiling insulation, programmable thermostats.

A. Yes.

Q. Do you think if Hydro offered these kinds -- this more expensive list of measures or some other extensive list, and in this kind of a convenient menu driven form to its new construction customers, and in this prescriptive path, as well as making things available in the performance path, do you think it might achieve higher energy savings from those who have slotted themself into the prescriptive path, for whatever reason, they are in a hurry, they don't want to think about it, whatever?

A. Yes, that's exactly why we wanted to get the prescriptive list expanded. However, what I'd point out is that this program, the designers get to pick from a list of energy efficient measures. So, obviously they are restricted to the measures that the utility knows about or thinks is the right way to go.

We try to get the creativity of the consulting engineering community freed up, and we will entertain any kinds of things. We are not tied down.

Q. But again, that is in the performance

side of the program. I was just looking at comparing the prescriptive sides of their program and yours.

A. I had a difficult time understanding where their performance part came in then.

Q. The prescriptive starts at page 36, it says "Prescriptive Area," the bottom, and if you look on page 37, the last paragraph there, we get into the comprehensive area. I gather that is the language they use.

That is where you see the same thing, incentives are earned by the design team and the ownerand so on?

A. Yes, those are earned by the design team. Okay, I had trouble understanding what that exactly meant.

Q. Okay. Do you see, are we on the same plane now here?

A. I probably -- yes.

Do you want to go back to the prescriptive incentives, and I will tell you what we get in Ontario for each of these things?

Q. No, I understood that these are -- I think we covered that already, that some of these are in other programs. I was just looking at what is on your prescriptive list and savings by design.

A. Yeah, but the same sales rep or customer energy service rep, however you want to refer to them, is out there and dealing with those things, and you can -- they can put all those things together. From the customer's point of view, it can be transparent as to which program it is coming in under.

Q. Okay. If that is the case, then it would be inappropriate, I take it, to assume we are going to have, in planning, than it would be more appropriate to treat a lot of the measures in savings that you are going to get as being formally, or through the means you have just told us about, informally part of one big bundled program, and then we are into this question of what OM&A number to apply, and you'd agree that we have got more of them now into the marginal category, where you can share delivery expenses?

A. Yes, and I think that's why for each program we only use the incremental admin costs, and that's why we end up with numbers as low as $65 a kilowatt for savings by design, because we know that that has been added on to the OM&A number, say, for the feasibility program or the power saver audits program or the lighting program and so on. When we do a business plan each year for each of the sectors, we do look at it that way, and for instance, really as far as

say the Ontario design community, consulting engineering community is concerned, we really have one big program. That is savings by design, but as far as the lighting contractors are concerned, we have a lighting program and so on and so forth. We see all those things, and under accelerated paybacks with industrial we break out specific campaigns under accelerated paybacks, but those are really just to highlight and increase the awareness and sensitivity with respect to particular technologies.

Q. Mr. Burke, did you want to say something?

MR. BURKE: A. For planning purposes, it is not an extrapolation of programs that yields the attainable potential, strictly speaking. The potential induced is calculated, as we have described, on a total building basis with all of the measures installed, and the actual mix of programs that will deliver those in the year 2000 and 2005 and so on, I think is yet to be determined.

What we do know is how we are delivering the programs now and their business plans for the first five years as to how results will be delivered in that first five-year period. But the program evolution is evolving. So, when you are asking for planning

purposes and how did we screen the results and that sort of thing, the potential induced were screened as packages as described, with average overheads.

The second point I'd make is that the results of the total customer cost test indicate that there is quite a margin in the commercial sector for almost all programs. That is, they are quite cost effective relative to avoided cost, and I really think, as was discussed this morning, it is fairly immaterial the precise allocation of the cost of programs, program delivery itself, to the numbers that are derived for planning purposes.

Q. Mr. Burke, you had to estimate attainable, and you did estimate attainable for the plan; not just potential.

A. That's correct, we applied the penetration rates that the program people thought they could ultimately deliver to the potential induced estimates, as the potential induced estimates were derived.

Q. We have been hearing from Ms. Fraser about how happy they have been with the attainment. We haven't heard from you yet about if the target obtained is going to change, but the total attained in your view will change, and you said you are going to look at

this.

I did understand --

A. What I said was Ms. Fraser will look at it and provide me with new pentration estimates if she believes they should change.

Q. Okay. Well, I can't resist.

Ms. Fraser, when will you be looking at? Have you looked at it yet?

MS. FRASER: A. Each year when we do the business plan, that's sort of the piece that's missing in here between programs and forecasts is the business plan. We concentrate for business planning purposes on five years, and then extrapolate past that. Those are the numbers that -- the basis of that plan is then looked at in a segment by segment basis, for instance in commercial, each of the segment supervisors who work for me, and look at the penetration rates in each of those segments as shown in Exhibit 76, and then those penetration rates are applied against the potential that is calculated through the screening process.

Q. So, that business planning process, I take it, you haven't told us about it, so I assume you have yet to go through this next round to come up with your new penetration numbers?

A. Actually I'm not sure if we have done

it this year, because I have been getting ready for hearings.

Q. Yes, I can understand.

A. I was going to say its going to happen in July, but I realize that July was a month ago; I have lost all sight of time.

Q. All right, so its impending?

A. Obviously, all the changes with respect to fuel switching mandation are going to make a big difference, so we are going to have to take a very indepth comprehensive look at those things in the process of getting up towards this year.

Q. So, that's coming down the pipe at us.

A. Yes. I can't offer you much on it right now.

Q. The faster we get you out here, I guess, the faster it will come down the pipe.

You then will get some new penetration numbers. You said you apply them to the potential numbers, and they will be applied to the new potential numbers that have been provided?

A. Yes, as the potential changes. As that comes from --

MR. BURKE: A. The potential induced

numbers would be reestimated as well, based on additional technologies that should be in and maybe some that should be out, and the product of the two, hopefully, will be produced this calendar year, if I'm going to get a 1991 load forecast out.

MS. FRASER: A. There go my holidays.

MR. B. CAMPBELL: We will defend your holidays. These witnesses, most of whom have also appeared at the OEB, have had a non-stop year for hearings.

MR. D. POCH: Mr. Chairman, I have a number of questions I'm getting to now, I am in the midst of, which look at a number of these questions about what others are doing, and given this information we have just received, it may be economic for me not to ask some of them, because obviously this is changing imminently. Perhaps if we took the break, I could just skim ahead and might save some time.

THE CHAIRMAN: All right, we will take the afternoon break; 15 minutes.

---Recess at 3:33 p.m.

...

---On resuming at 3:49 p.m.

THE CHAIRMAN: Be seated, please.

Mr. Poch.

MR. D. POCH: Q. Mr. Chairman, over the break we were able to get in touch with our consultants and they were able to fax us two things, which we have provided and laid before you.

First of all, a clarification of where the source numbers have come from in our background materials of Volume 2, just looking for my copy, the table at page 18. The Hydro witnesses were concerned because they couldn't reconcile them with the numbers they had for Ontario Hydro.

If you look in the materials that have just been placed before you, you will see the sources circled on the last page. These come right out of figure 7-22 of the demand management plan in the balance of power.

First of all, Mr. Burke, Mr. Wilson, you can confirm that these numbers reconcile with that vintage of Hydro data?

THE CHAIRMAN: If they just got it the same moment that I just got it, perhaps we could give them overnight to just make sure that's right. I am not for a minute suggesting it isn't, but --

MR. D. POCH: Mr. Chairman, if I may, I think that the numbers are just perfectly straight inplants and differences.

Q. Mr. Wilson, you can take the Chairman's suggestion that you can check the sums later, but that's appears to be correct.

MR. WILSON: A. I will take the Chairman's suggestion and get back to you.

Q. Just to help us along a little here, our consultant was kind enough to re-do the table, a revised version based on page 60. I will again ask you page 60 of Exhibit 25, and I will ask you if you can tonight check the sums on that, too, and that's page 1 of this and perhaps we should give this an exhibit number, MR. Chairman.

MR. BURKE: A. Before you do that, Mr. Poch, I think what I was saying to you in the break was --

THE CHAIRMAN: Just a moment, Mr. Burke. Let's give these three sheets of paper an exhibit number so people will know what we are talking about. Exhibit number?

MR. NUNN: 276.

THE CHAIRMAN: 276.

---EXHIBIT NO. 276: Revision to Ex 270, page 18 with DSP source.

THE CHAIRMAN: Carry on, Mr. Burke.

MR. BURKE: What I was going to say was the numbers that are in the DSP document turn out in fact to be the correct numbers for that vintage, and there was an errata sheet apparently which replaces page 60 of Exhibit 25, and these numbers that are here seem to correspond to what was originally in Exhibit 25. They were then replaced by an errata sheet. My point was Exhibit 76, which is two years later, is even higher than the numbers in Exhibit 25 before the errata sheet. But, if you are trying to stick with Exhibit 25, then actually you had the correct numbers the first time.

MR. D. POCH: Q. So, we had the correct numbers in terms of numbers that have a vintage of when this plan was struck, when the target of 2000 for 2000 was struck. We have provided you with the reference to the actual balance of power document and you are telling me now that if we went to the original page 60 of Exhibit 25, we would find the same numbers, although there has been some change -- there is a new page 60 or is this page 60 which has the higher numbers some version of Exhibit 76 numbers? I'm not sure I

understand.

MR. BURKE: A. My understanding is that the printed-up document of Exhibit 25 contains the numbers that are in your latest Exhibit 276.

Q. Yes.

A. But that those were replaced by an errata sheet some time ago. And the errata sheet ended up with numbers consistent with the DSP document itself.

So, you were working with the correct numbers from two years ago or three years ago. They still are much lower than what we are seeing today in Exhibit 76.

Q. Just in in terms of that, I just looked -- and we can just look on this new version, Exhibit 276. If we looked at the fourth comparison there where the Hydro numbers go to 2000, the planned energy savings come out just shy of 10 terawatthours. I had actually looked at Exhibit 76 -- would the correct page be 69 of that?

A. Yes.

Q. There we see it is 10.6 by the time we get to Exhibit 76?

A. Yes.

Q. So, just doing the comparison,

ballparking it there, we still have Northeast Utilities compared to your Exhibit 76 numbers on this percentage basis new DSM compared to new load doing twice the percentage performance; fair?

MS. FRASER: A. Targeting.

Q. Yes.

MR. BURKE: A. Yes.

Q. Okay, thank you.

MR. B. CAMPBELL: Mr. Chairman if I could just get one clarification from Mr. Poch. Where Mr. Poch has used other utilities in this, has he used the numbers that those utilities were doing at the time of the Hydro numbers that he is using; that is, are they the same vintage estimates, for instance, for Northeast Utilities as for the Hydro? Or are we looking at Northeast Utilities current numbers and Hydro old numbers?

MR. D. POCH: Well, I can help there, Mr. Chairman. It's a good question. First of all, the comparison we just did a minute ago is your most recent numbers. And the answer to Mr. Campbell's question is these are the most recent numbers we have from those other utilities and indeed if you look at the sources they are noted there as typically 1990 sources.

So, I take it the comparison we just made

a moment ago where we saw Northeast doing twice as well on a targeting basis for that time frame is all the newest data available from both utilities.

MR. B. CAMPBELL: Well, Mr. Chairman, I object to Mr. Poch referring to this as doing twice as well as on a targeted basis. The numbers are the numbers. The evidence that this panel has given is that the question of how well one is doing also has to take into account what the potential is in these other utilities, and there has been no discussion of that.

MR. D. POCH: Mr. Chairman, I appreciate Mr. Campbell's point. I don't think it is appropriate for him to be giving evidence at this time. I think his witnesses have made that point and indeed also agreed to the suggestion I put to them a minute ago and I don't think it helps for Mr. Campbell to object after.

THE CHAIRMAN: I think he was objecting to you giving evidence rather than to him giving evidence.

MR. B. CAMPBELL: Exactly, Mr. Chairman.

THE CHAIRMAN: Both of you are objecting to each other giving evidence.

MR. D. POCH: Well, all right.

MR. B. CAMPBELL: I was objecting to,Mr.

Poch's characterization of somebody else doing twice as well when the evidence, in fact, given by this panel is that to make that kind of comparison, you would have to at a minimum understand what the equivalent potential was. That's the evidence. Not what Mr. Poch says. I am objecting to Mr. Poch going beyond the evidence in describing something to you.

MR. D. POCH: Q. Mr. Burke, do you have any information that you can give us on what the baseline efficiency, embedded level of efficiency is in the Northeast United States? Do you have any reason to believe that they are significantly less efficient than Canadians?

MR. BURKE: A. I can't claim to have studied the efficiency level in the Northeast.

Q. All right. Back to programs. Ms. Fraser, in the savings by design, is there a cap or a guideline for the percentage incentive level in your prescriptive program? Those are the three measures there.

MS. FRASER: A. No, there is not.

Q. It's open ended?

A. Yes, I believe so. I might have to check that, but I am pretty sure it is.

Q. Could you also assist us in telling

us what proportion of new construction in square feet, which I take it is the basis of the load forecast, in the Hydro service area the program will reach in -- it is as a three year life program, at least it was foreseen as three years in the materials, I take it?

A. Yes. The particular analysis and the particular approval that we got for that program was a three year horizon.

Q. Is that number available to you easily?

A. The square footage?

Q. The portion of new construction square footage?

A. That we expect savings by design to affect?

Q. In that time frame.

A. I don't know. I will have to check.

Q. Could we find that out, please. I guess we should get an undertaking for that because that will take a little digging through your materials.

MR. NUNN: 267.7.

THE CHAIRMAN: Ms. Fraser, you are not able to --

MS. FRASER: No, I don't think I can tell it from the tables I have with me.

THE CHAIRMAN: That will be 267.7.

---UNDERTAKING NO. 267.7: Ontario Hydro to provide the portion of new construction square footage it expects savings by design to affect throughout the province.

MR. D. POCH: Thank you, Mr. Chairman.

MS. FRASER: Just for clarification, Ontario Hydro's service area, you don't just mean our retail system, do you? You mean the whole province?

MR. D. POCH: Q. Captured by, potentially captured by the program in the whole province I guess would be a fair way to put it.

And I notice if we go to our background materials, Volume 1, Exhibit 269. Can you turn to page 40 there. This is Northeast Utilities again and they are projecting for their program, if you look at the first table there, 52 per cent market share by '93 and 80.3 per cent market share by '96.

A. I believe those are cumulative numbers.

Q. Yes.

Do you have any idea of how Hydro's program would, what the comparable numbers would be for Hydro's program?

A. Mr. Burke, perhaps while Ms. Fraser is looking for that, this is an illustration of this

sort of levelling off that in that case is occurring at around 82, 83 per cent market share, after the ramp up that you spoke of yesterday?

MR. BURKE: A. It seems to be, yes.

Q. And they seem to be hoping to get to that point in five or six years?

A. Yes, the ramp up in five or six years corresponds to sort of assumptions I would make. The level is another matter all together.

Q. Yes.

MR. WILSON: A. Mr. Poch, just to add to that. I took your numbers and did a little bit of arithmetic because we have been talking about annual penetration rates leading to an average saturation or penetration. It would appear that Northeast in their commercial program is expecting to go from nowhere to 59 per cent in 1992 to 89 per cent in 1993, 91 per cent, and then falling back towards 83 per cent on average. They have an enormous challenge before them. So, they are expecting to go well beyond the 79 per cent we were talking about.

Q. I take it they are a much smaller utility with a much smaller service area to have to worry about?

A. I believe that's true.

Q. Do you have that number for us.

MS. FRASER: Yes. We break it down by segments and it is in Exhibit 76 on page 47. We break it down into existing and new again it is an average penetration rate as opposed to a cumulative.

THE CHAIRMAN: It appears that page 40 applies to new only; is that right?

MR. D. POCH: Yes, I think that's right, Mr. Chairman.

MS. FRASER: New commercial and industrial.

THE CHAIRMAN: Yes.

MR. D. POCH: Q. Can you help us reconcile these then because I see that on page 47 you do break out some new versus existing?

MS. FRASER: A. Yes, the total new is 39 per cent average over the year. I would have to get my mind in third gear to figure out the differences between cumulative and average at this point.

Q. Well, Mr. Wilson, can you help us. Did you crunch for us the comparable number from Northeast.

MR. WILSON: A. Northeast is looking at 83 per cent.

...

[4:05 p.m.] Q. Okay. That's fine, we don't have to do it the other way. So, the 83 would compare to the 39 then here?

That's right, Mr. Wilson, we're talking about the same kind of number, other caveats being what they will be, no doubt?

A. I believe that's right.

Q. All right. I notice that NEES runs a direct installation program for customers 50 kilowatts and below, and I notice you have a fast track program for relatively smaller customers too; is that correct?

A. Excuse me, Mr. Poch, I just discovered I made a mistake in answering your question.

Q. Okay.

A. Our figure is 39 per cent of the potential in terms of peak reduction megawatts.

Q. Oh yes, of course.

A. Northeast Utilities is a participation which is 83 per cent of their customers will have saved something.

Q. Right.

A. It might be one compact fluorescent per building, so...

Q. So, there's no way from these numbers then to make a direct comparison --

A. I'm sorry.

Q. One's people and one's megawatts?

A. You cannot compare them, no.

Q. Okay. This is, indeed, the point the Chairman was concerned about yesterday about the use of the phrase market penetration. In the advertising business, I take it, it usually refers to how much of the customers you've gotten at?

I take it though that in the Northeast Utilities -- I'm sorry, in fact just to clarify that further. Am I correct in understanding they've actually done it on a square footage basis. I think that clarification is at the top of page 40.

A. That's what page 40 says, yes.

Q. Okay.

A. There's no indication of how much energy they're going to save.

Q. Yes.

MS. FRASER: A. Or even --

Q. And that would, I take it, depend a lot to what extent they're capturing all the measures within their program and inducing amongst participants all the cost effective savings?

A. That's correct. If we look at the office building segment in Ontario existing, 4 per cent

of the buildings account for close to, I think it's 48 per cent of the square footage, and I'm not sure if we have a project in each of those large buildings, but I would be surprised if we didn't have one in almost all of them.

So, if we wanted to talk, you know, the square footage terms we can get some up pretty quickly when we start adding the Olympia & York, First Canadian Place, Scotia Tower and all the rest of them.

Q. All right. Turning then to small commercial/industrial, I was just asking you that you have some kind of a fast track program for relatively smaller, 50 kilowatt and less?

A. Yes. We knew when we developed savings by design with the customized aspect to it it didn't really lend itself to deal with some of the smaller ones.

What we've done there is we really have two fast tracks, one for less than 50 and another one for less than 200. The ones that are less than 50 kilowatts, I believe, could be approved by our field offices, the larger ones comes in and a committee determines it as opposed to running simulations and other sorts of things.

In addition to that, as I indicated in my

direct evidence, we are also looking at developing a direct installation program for small commercial buildings.

The research that we have seen in the States indicates that you receive higher penetrations with carefully targeted programs and we're doing that with non-profit, and once we get far enough down the road with non-profit to make sure that we've covered most of the big pitfalls, we'll head down the same road for small commercial buildings.

Q. In that expanding, I take it, program for 50 kilowatt and less, do you install, free of charge, all cost effective lighting measures?

A. Okay, just so I'm clear here. The mechanism by which they can fast track through savings by design isn't a case where Hydro installs, it's a case where we work with the owner, develop projects, we'll do feasibility studies, if necessary, and so on.

The program that we're in the process of developing now to be a direct installation program will be one where we certainly look at all the cost effective measures and determine the best way to go about getting them installed.

Given that the definition of cost effective measures has, of course, been developed for

typical buildings, and I've yet to walk into a typical building.

Q. That's like the economist who drowns in the average lake of 3 feet of water, or the lake of average, 3 feet of water.

A. He shouldn't have made all those assumptions.

Q. That's right. The direct installation program then, what program would that be for lighting smaller commercial/industrial?

A. That's the program that we're developing right now, it's in the design stage. We are -- as I said, we're right in the middle now of putting the non-profit housing program out, which is a direct insulation program, and rather than setting two separate design teams down the same road to get to the same place at different times, we're going to make sure we get all the pitfalls filled up with one program before we start the other one, but we're looking at the whole range of options.

Q. Okay. Do you have a new construction program in the industrial sector?

A. The savings by design would apply to the industrial sector. With respect to any HVAC or lighting kinds of things in new construction, the

accelerated payback program would apply and so would motors and so on and so forth. So, usually you don't see a lot of "new construction" In industrial, what you get is a plant expansion or a plant addition, so it's a very different kind of marketplace to deal with.

Q. Okay. Let's switch to the residential sector, Ms. Mitchell, can we talk about the power savers audits program or the home tune-up program I think it's called as well.

First of all, the target for that is single-family dwelling customers?

MS. MITCHELL: A. Yes, it is.

Q. So, it doesn't seek to capture multi-family --

A. No, that's part of the commercial sector.

Q. All right. If I understand it correctly, your customer receives an audit form in the mail, the customer fills out the audit and mails it to Hydro, the audit form asks them to describe their house and the baseline situation there?

A. Correct.

Q. And then you do an analysis on that. First of all, you make recommendations about -- that analysis would come up with recommendations about

energy efficiency improvements?

A. Yes, that's correct.

Q. All right. Do I understand that you expect a 50 per cent response rate; that is, 50 per cent of the customers you've targeted will and 50 per cent of the customers you've targeted won't return the audit form to begin with?

A. That's correct.

Q. All right. What happens to the 50 per cent of non-respondents?

A. If those people do not respond there will be other mechanisms in which to reach them, maybe through advertising or further direct mail.

Q. All right. And over the next three years you anticipate at least 600,000 targeted homes will get a follow-up visit?

A. Yes, that's correct.

Q. Just so I understand, what proportion is that of the number of homes that are initially targeted to receive -- how many single-family dwellings are we talking about?

A. 2.7 million.

Q. All right. So, 2.7 million, and then of roughly 1.35 million you anticipate to respond?

A. Correct.

Q. Is it of that group then that you would go and do a follow-up visit to roughly 600,000?

A. Yes.

Q. I take it you would target the high electricity users, the homes with electric space and water heating?

A. That's correct, as well as high users of electricity.

Q. Okay. Doesn't this raise a concern about sort of cream skimming; there's going to be a lot of cost-effective potential in the ones you don't go and visit, just it's not as much per home.

A. I'm not sure what you mean. If we're targeting homes which have electric water heating and/or electric space heating, I'm not sure how that's cream skimming, that's our target market.

Q. What about lighting improvements in the homes that aren't electrically heated?

A. Those are captured as well.

Q. But you're not going to give them a home visit?

A. We're not targeting those homes because it's not cost-effective to do.

Q. Okay. So that would be a category, for example, where a determination of what's cost

effective, what counts, what doesn't count, what the OM&A costs assumed are and so on may bring in a good chunk of people with a number of measures not in the electrically heated sector, so not the sector that's going to fuel switch anyway, may or may not bring them into the economic potential, the realm of economic potential, the realm of attainable?

A. Correct.

Q. All right. Back to the 50 per cent of the eligible population that respond to your mail inquiry, Hydro goes and visits 600,000 of them, during this visit -- well, let's turn to page 71 so we can look at the list together.

Page 71 of Volume 1, Exhibit 269. I take it, first of all, in general terms you're going to install some energy efficiency measures, leave behind a measure, and you're going to provide some do-it-yourself measures and information?

A. Yes, that's correct.

Q. The audit information that you send back to the customers themselves, is it directing customers to take actions that will not actually be installed by -- excuse me, or provided by Hydro in the follow-up home visit?

A. No, it recommends all actions.

Q. Okay. If you can keep that open there and also turn up Exhibit 25, Appendix B, page B18. Actually, I think we may have included this in our materials. Yes, at page 77 of that same volume of materials might be easier.

This shows from Exhibit 25 the attainable -- at the time at least, the attainable savings by residential space heating measures, so these are measures that are of importance in electric space heating situations.

I take it then these would include insulation of ceilings, walls, doors, those would be considered suitable?

A. Yes.

Q. All right. Is it the installation of these kinds of measures that the audit would provide the customer with recommendations on?

A. Yes, they would be provided with recommendations for follow-up action.

Q. Right. Going back to page 71 then and 72, I take it from this page 71 what you leave behind - and you can see there's sort of three categories on that page - electric heating, water heating only and then, in the middle electric water and space heating, at the bottom, and gas space and water

heating homes.

The leave-behind package would depend on whether it's heated with electricity or not; correct?

A. Yes.

Q. Now, in that category, heated by electricity, you will actually install three things; am I correct, that deal with heating, first of all, and they are: you will caulk and weather strip one door and one window, you'll do one door sweep on one door and you'll plug one plug outlet gasket and one wall switch gasket; correct.

...

[4:20 p.m.] A. Correct.

Q. And these are all the air sealing -- these are all air sealing measures? I guess they are intended to reduce heat loss through infiltration?

A. Yes, they are.

Q. All right. You leave behind calking and weather stripping for the customer to deal with the rest of the windows and doors?

A. Yes, we do, after showing them and demonstrating to them how to use it.

Q. Right. And so you'd leave them a caulking gun and a tube of caulk, and you'd give them some training on this?

A. Correct.

Q. Are you aware of evidence concluding that in order to be effective, air sealing measures, first of all, have to be correctly applied?

A. Yes, I am aware that it does need to be correctly applied.

Q. Some sources matter and some sources of air leakage don't matter, and that --

A. Weather stripping and caulking are considered a do it yourself project.

Q. Right. And you are aware that it is sort of notorious that significant sources of air

leakage are often difficult to find, based on visual inspection, even by a well trained professional? You need to use a blower door or infrared scanner to track these things down?

A. Yes, for those that are unseen. However, a great amount of air leakage can be solved through weather stripping and caulking.

Q. You are familiar, then, I guess with the '77 Twin River study, Princeton, on that topic?

A. No, as a matter of fact I'm not.

Q. Well, nothing much turns on it. You can enjoy that at your leisure.

A. Thank you.

Q. So this is only going to capture, then, the kind of visible leaks that its easy for the customer to go after and --

A. Yes, and these measures intended as demonstrations to the customer of the types of things that he can do himself, he or she.

Q. What about the insulation measures that we discussed a moment ago on page 77 that were in Exhibit 25 as sources of attainable induced EEI? Actually, if we go back to page 77, we noted the ones above that highlighted line where it says "equals 31," various types of insulation there; ceiling insulation,

wall insulation of various types, basement wall insulation, basement floor insulation, door insulation. You don't install those either, do you?

A. No, we don't, because it is not clear that it would be appropriate at that time. If say for example the information I gave you this morning about renovation and tearing down a wall, just because it is recommended doesn't mean it is appropriate at that time.

Q. But these are on your list of things which are both economically potential and you believe to be attainable at a five or a ten per cent penetration level.

A. That is correct, and they would be provided to the customer at the time of the audit in a separate program.

Q. I take it that if they are applicable, they'd show up on a prioritized list of measures you'd leave with the customer?

A. Yes, they would show up on a list of measures.

Q. You found that you have created that list from the analysis you did of the mail in audit that proceeded the home visit?

A. That's correct.

Q. All right. Or you could have found it from the 15 minute walk through audit I take it.

A. Yes.

Q. So, just so we understand this, sort of the prognosis for cost effective treatment with these major measures most likely relies on the patient's own diagnosis, the answers to the questionnaire.

A. Yes, to a large extent, yes.

Q. So if the customer doesn't get this -- if the customer is in the group that isn't visited, that's what they get, and if they are the ones that are visited, then they can -- they might get some further advice from the 15 minute walk through?

A. Yes, as well as all the information contained in the leave behind package.

Q. I take it that what the auditor would do is to write up the "top three" recommendations? "Top three" I think were in quotes.

A. If the customer had not filled out an audit.

Q. All right. Why wouldn't you write up all the recommendations there?

A. If we were to do that, it would probably take an exorbitant amount of time, and given

the fact that we are doing 600,000 audits in a relatively short time horizon, we can't afford to spend that amount of time.

Q. I see.

A. So we are looking at the major hits within that home, and then to use the leave behind packages, et cetera, to backfill that.

Q. So these are the "top three" that are the major hits, as you have said. What program do you have to pay customers incentives to install these big ticket items?

A. I am sorry?

Q. What program do you have to pay customers incentives to install these big ticket items?

A. Well, we have a number of programs that are outlined in the PCRD. I can list some of them, if you'd like.

Q. For the insulation? Can you just tell me briefly?

A. Well, the insulation program is currently in development, pending changes to the Ontario Building Code.

Q. I take take it for windows, you have a low "E" window program?

A. Yes, we do.

Q. That program pays the full price premium, that is the full incremental cost of --

A. Cost of -- full incremental cost, yes.

Q. Yes, what are calling low "E", standing for low emmissivity windows--

A. That's correct.

Q. --rather than the standard, which is now double pane windows?

A. Correct.

Q. So for a customer who is considering replacing existing windows anyway, you will see to it that the customer doesn't have to pay anything extra to get these extra higher efficiency windows.

What about the retrofit situation, where a customer wasn't planning to replace them anyway? They'd have to --

A. This program is not targeted at those customers.

Q. The low "E" window program is not targeted at them either.

A. It is targeted to those customers who are already planning to replace their windows, or in the case of new construction.

Q. Is that because that would put you

beyond your total customer cost test?

A. Yes.

Q. To retrofit?

A. Yes.

Q. So there is another example of a measure which we couldn't -- we'd find on your list, that is low "E" windows, and we'd find on those cost curves of the other utilities, but it isn't in the attainable or the economic potential numbers as those numbers are currently based on the current avoided cost.

So this isn't a measure that is sort of a measure that is missing from your list, it is just you are not going to put it everywhere, because there is places where you believe -- there is situations where you believe it is not cost effective.

A. That is correct.

Q. What about storm windows? They can be retrofit, can they not?

A. Yes.

Q. Do you have a program to pay incentives for retrofitting of half decent storm windows?

A. No, that's considered the standard market default. We are looking to improve and go

beyond.

Q. Do you have a program to pay for low "E" upgrades of storm windows?

A. In electrically heated homes, yes.

Q. Let's first of all just look at the --

MR. BURKE: A. Could I just add a little fact to the discussion of windows? In the energy efficiency potential of the existing electrically heated housing stock in Ontario, that thousand house study final reported, referred to in my direct, it gives the typical total cost of a window replacement in the thousand house survey, and that was $9,700.

The conservation portion of that is about 27 per cent. So that we are talking about a factor of four times the cost. We have estimated the total customer cost levelized unit energy cost of these windows at 4.7 cents. So we are talking about if we were to do the whole thing, roughly a 20 cent measure.

Q. There is obviously something in between, where you offer some incentive, and you get the customer to chip in some of that?

MR. SHALABY: A. Doesn't change the total cost.

Q. Right. And if we could look at page

76 of our exhibit, this is from the PCRD description of this power savers audit that you talked about, Ms. Mitchell, and do I interpret this correctly that the the savings are projected at 83 megawatts in 1992 from the program, it's roughly about a thousand gigawatthours in 1992?

A. Yes, that's correct.

Q. The basis is, in the second column there, 26 megawatts -- it says, "Audit, 26 megawatts"?

A. Results from the audit directly--

Q. Right.

A. --of the recommended measures being implemented.

Q. can I take it that that is, since free riders is blank, that that is 26 megawatts from that program that would -- you presume would not have occurred without that program?

A. That's correct.

Q. If we go back to page 77, we see the EEI attainable by the year 2000 is the third column there. The first eight measures there add up to 31 megawatts. That's by the year 2000.

A. Yes.

Q. Can you explain how two years of energy audits add up to 26 megawatts, which is the

better, the bulk of the whole 31 megawatts attainable from space heating insulation improvements, as you have seen there? What percentage of homes are you planning to cover in the two years? I thought it was --

A. The 600,000.

Q. 600,000.

A. Excuse me, but the 26 megawatts that you are referring to that result from the audit, are based on the pilot results, which indicate that 36 per cent of the measures that are recommended in the audit portion alone are implemented by the customer. And this will take place over a period of one and a half years.

Q. So you see a two-year program getting you 26 megawatts, but by the end of this century will only achieve 31 megawatts?

A. Well, this program was put into place to accelerate getting those megawatts.

Q. Okay.

A. And is using some of those transferred funds.

Q. So this is an example where we can get the 2000 by 2000 is in fact, in this case, part of that is -- can be had before 2000 cost effectively.

A. Yes.

MS. FRASER: A. I might also point out, Mr. Poch, that what you have on page 77, as you said from in Exhibit 25?

Q. I am sorry, say that again.

A. What you have on page 77 you said is from Exhibit 25.

Q. Yes.

A. Exhibit 76 provides a more up to date estimate of potential, and you notice that compact fluorescents aren't even in here.

Q. Yes.

A. So I think if we looked at Exhibit 76, appendix A4.

Q. If I can find it, I will join you.

A. Okay. And its continued on the page -- there are some different --

Q. Here we go. I'm sorry, the page reference?

A. A4, which is the first appendix, page 4, I guess, or table A4.

MR. BURKE: A. You may remember, Mr. Poch, that I indicated in my direct that having had the results of the 1000 house study, the estimates of retrofit potential in the existing stock were considerably higher than previously.

Q. Just looking at the -- so what this -- I have just glanced at this list. I take it what has changed is the potential number, that's the big change here, but that the average penetration rates are roughly the same as what was presumed at the time of Exhibit 25?

MS. MITCHELL: A. They are roughly the same.

Q. Yes. Isn't it fair to assume, then, that if you can get 26 of what was assumed to be 31 at the time of the plan being struck in less than two years, that the potential assumed in the plan is probably an underestimate, the attainable number assumed in the plan is probably an underestimate?

...

[4:35 p.m.] A. No, I think we are just bringing forward megawatts that were already included in the plan.

Q. We have looked at these penetration rates in Exhibit 25, Exhibit 76, they are roughly the same. They tend to be 3 per cent, 10 per cent, 20 per cent kind of numbers.

Let's just talk about an average number of about 10 per cent. Do you think if Hydro instead of just leaving behind the list of the big three for people and letting them do it when they get to it, that sort of thing, if you went out and --

A. That's not our intent to let them get to it when they feel like it. Our intent with the program is to use the audit to build a data base which identifies specific target markets for area-targetted initiatives.

Q. Does the 26 megawatts then include the follow-up targeted initiatives?

A. No, it does not.

Q. Okay. Once you do those targeted initiatives, what kind of penetration numbers are we talking about getting? Is that the 20, 10, 3 and 10 in the attainable? That is from all program approaches?

A. Yes, that's correct.

Q. So then you are going to get 26 out of 31 just from the audit part, the telling people about it, and you will only get another 5, though, when you go in there with targeted programs and incentives?

MR. B. CAMPBELL: Where does the 5 come from?

MR. D. POCH: The difference between the 31 total attainable and the 26 that you are getting through the audit program.

MR. B. CAMPBELL: I thought you had directed us to Appendix A4 which shows quite different attainable numbers.

MS. MITCHELL: In Exhibit 76.

MR. D. POCH: I'm sorry.

Q. So then this is an example where the amount you are getting from the audit program is on the scale of that that was assumed at the time of Exhibit 25 in the plan. But what you are telling me now is there are targeted programs, and would that account for the higher number of megawatts here that we see in Exhibit 76?

MS. MITCHELL: A. Yes, that's correct.

Q. But the penetration rates haven't changed. Why wouldn't we expect -- I guess I am having a little difficulty reconciling this. If you thought

you were going to get 10 or 3 or 20 per cent penetration from the audit program, whatever the potential out there was, you got new information about the potential, why wouldn't you just upgrade what you figure you would get from the audit program and then what you would get from these added targeted programs would just be gravy. Do you follow me?

A. No.

MR. B. CAMPBELL: I don't understand the question. It has been pointed out that the potential estimate was changed substantially.

MR. D. POCH: Yes.

MR. B. CAMPBELL: And I am not sure I understand the question.

MR. D. POCH: We have agreed the potential estimate has risen, but the penetration rate doesn't seem to have changed.

MS. MITCHELL: This program --

THE CHAIRMAN: Excuse me. Just so that I am following. The Figure 31, which appeared on page 77, now appears to be 57, looking at page 84 of Exhibit 76. Does everybody generally agree that that's right?

And if that's right, then the reason that is so has to be, given that the penetration rates have been relatively constant, that the potential induced

EEI has gone up.

MR. D. POCH: Perhaps you can help us here, Ms. Mitchell, because I had not been reading it the same way as the Chairman. I had assumed that the change of potential was far more dramatic than that; that, for example, 174 megawatts sealing floor insulation would have -- I'm sorry, no. My apologies again.

We would have to add up sub total thermal envelope measures, attainable induced, and it would be 68, not so dramatic.

THE CHAIRMAN: No, it is 68 less 11 because air sealing measures aren't listed in the earlier one.

MS. MITCHELL: That's correct.

MR. D. POCH: Thank you, Mr. Chairman, that certainly helped me, if it helped no one else.

MS. FRASER: But we should add those back in because that was part of what was added to the potential was that new initiative wasn't included in Exhibit 70 -- in 25. It has now been added to 76.

MR. D. POCH: Okay.

MR. BURKE: As well as the light measures and so on, the compact fluorescents and all that, which are part of the program results that you are

enumerating. So there is another 18 megawatts lower down for compact fluorescents on page 2 of 2 for Appendix A4 and 15 megawatts for replacement lamps.

THE CHAIRMAN: But in general, if it's safe to do that in this context, in general there has been a significant increase in the estimate of the potential EEI and that accounts for the increased potential.

MR. BURKE: Yes.

MS. FRASER: Increased attainable.

MS. MITCHELL: Attainable, yes.

THE CHAIRMAN: Attainable, I'm sorry.

MR. D. POCH: Q. So had you added no more programs and you felt your program that you had started out with was -- at the time you had looked around, you had compared programs, you said gee, we are likely to get this kind of penetration. You haven't changed your penetration rates here.

I would have thought then without change of programs, just new knowledge about what is out there physically on the ground, you would have simply scaled up the attainable in proportion to the scale up in the potential. But you tell me you have also added new targeted programs with incentives. Right?

MS. MITCHELL: A. Right.

Q. So wouldn't we expect the scale up to be more than proportional because now you are talking about incentives and targeted programs, whereas before you were just leaving behind a list to tell them to insulate when they get the chance.

A. And we will be scaling these up somewhat based on program experience, which we did not have.

MR. BURKE: A. I would just like to make a comment still. You are going back and forth between programs and attainable. And the attainable numbers, the penetration rates are long-run numbers that are independent of the actual particular path of programs that it takes to achieve these results. These are estimates that people are making prior to knowing the specific programs which will deliver the full results.

Clearly as we learn more and more, we may want to change those estimates, but they are estimates that you couldn't say if you had these programs in place at Day One and now you add a few more programs, you should expect the attainable percentage to go up. That's not the case. We definitely had expected programs to be added over time. The question is: What in the final analysis did we expect the percentage of the potential induced that we would obtain is? And

that is what was being estimated originally.

Now we may discover when we get out there that we can obtain more or the world may change and our incentive structure may change or whatever and that causes a change in those results. But simply adding more programs than before should not by itself cause one to necessarily conclude that the attainable proportion has to change. Effectively, the estimate was based, as I say, independent of the particular menu of programs.

Q. Let's just generalize this a little bit then -- sorry, not generalize, but back up a minute. You have told us the potential is virtually doubled from your original estimate in this category of measures. It went from 31 to 57 or 68, depending if you count air sealing, which is a different measure, although it has been added into this group.

MR. B. CAMPBELL: That is attainable, not potential.

MR. D. POCH: Yes, I'm sorry.

Q. The attainable has doubled and that's simply using the same penetration rates, a linear scale up of what has happened at the potential, so I assume the potential - I haven't added the numbers - but I assume the potential has roughly doubled too? Mr.

Burke, you are nodding.

MR. BURKE: A. Yes.

Q. And so if the attainable is now 57 or 68 - I don't know when the air sealing was added to your program - in the PCRD, you are projecting 26 of that after a year basically of the program, somewhere between a year and two years, so that is fully 50 per cent, depending on which number we use.

And from that, dose it seem reasonable to assume that you are going to be able to raise your penetration targets for the year 2000? Cumulative average, whatever.

MS. MITCHELL: A. If we achieve the program results.

Q. Okay.

MR. WILSON: A. Mr. Poch, there is one more element of difficulty in mapping from one set of numbers to the other. And that is that the program results that are identified here are identified as having no free riders, and that really means we think that in the year that the weather stripping was on and the plastic film gets in place, and so on, the shower heads and the lights and so on, that that wouldn't have happened in the absence of this. It's a special initiative.

The exercise we go through to generate, go from program to really net impact on the demand for electricity recognizes that, as Mr. Burke has explained, over time people catch on to these things. People are expected to pick up more and more of the things which are obviously smart things to do. They will go to the store and they will buy compact fluorescent on their own possibly, they will buy some plastic film for their patio door. And this is becoming more and more wide spread.

As a consequence, the megawatts that are indicated as being saved in the PCRD for this program will have less impact than they appear to have by the year 2000, just because the natural part of the load forecast assumes implicitly, unfortunately not too explicitly, that this does materialize over time. And so that as part of my job in evaluation will be to try to assess as time goes on the degree to which this program has accomplished something which could not or would not have happened in its absence.

The distinction between gross results as reported and the net impact in demand for power is a distinction which probably explains some of this miraculous accomplishment in two years of what we apparently had earlier thought was going to take ten.

That's part of the explanation.

Q. Let's just look at one particular part of this, the leave-behind measures, page 71. You are going to leave behind one compact fluorescent, is that right, several energy efficient incandescent lamps, and a fridge thermometer? That's the ones that all customers get no matter what they heat with?

MS. MITCHELL: A. I'm sorry, where are you reading from?

Q. Page 71 of our exhibit.

The items that get left behind everywhere that don't depend on heating with electricity or water heating of electricity would be a fridge thermometer, a compact fluorescent, and several energy efficient incandescents?

A. Correct.

Q. All right. And I take it that that compact fluorescent is either an 11-watt or a 15-watt Osram?

A. Or any other CSA-approved bulb.

...

[4:50 p.m.] Q. But this is the one you are leaving behind. This is not the multi-retail program. This is the one you are leaving behind. I had gotten that from -- the 15 and 11 watt is referred to in a memo that appears at page 97 of these materials. Compact fluorescent give-away. It doesn't really matter who manufactures them.

A. Yes, I'm quite sure it's not dependent on one manufacturer.

Q. All right.

A. And this memo I believe was in reference to another program and not the home tune-up program.

Q. Oh, all right. Okay. But you agree in the home tune-up program you leave behind one compact fluorescent?

A. We'll be installing one, yes.

Q. Installing one. And while we're at page 97, if you look at page 98, this is BECo, which is Boston Ed Company, I think, do you see there that they'll replace six or eight fluorescent bulb installations replacing high use incandescent bulbs?

A. Yes, I see that. We haven't found seven or eight places for compact fluorescents in a home.

Q. But you might find more than one?

A. Yes, I would agree with that, that's why we leave behind coupons.

Q. And the coupons are to get people the $5 discount on the $20 bulb at the Loblaws sort of thing?

A. Correct.

Q. And do you think that that kind of difference in program approach, leaving behind as many as are found to be cost effective, up to six or eight per home, as opposed to leaving behind coupons for a 25 per cent discount might get the better penetration rate of what's attainable and cost effective?

A. Well, I suppose it depends on whether you're looking at it from a short-term or a longer term perspective, and certainly our strategy has been to raise the awareness of these energy-efficient technologies, make sure people understand and know about them and can benefit by them, as well as concentrating on creating the market for them that will be sustained over time.

Q. All right. And you leave behind some energy-efficient incandescents. I take it that's for places where compact fluorescents either don't fit or they aren't justified because of the amount of time the

bulb is on each day?

A. That's correct.

Q. I understand these are 52 watt or 90 watt bulbs?

A. Yes.

Q. And these are not tungsten halogen lamps?

A. No, they're not.

Q. Tungsten halogen lamps last longer; do they not?

A. Yes, I believe they do, however, they're not widely available.

Q. Okay. One of the separate sheets we handed out that was given an exhibit number at the outset, this is the one headed DSM 330, Exhibit 273, this is New York, NYSEG - I can't remember what the acronym stands for - and do you see at the top there they say:

> Halogen tungsten capsule lights. These bulbs, which are the same size as regular incandescent, will be placed in any fixture that could not accommodate a compact fluorescent bulb but can accommodate these bulbs. They reduce energy consumption by 30 per cent and

last almost four times longer than regular incandescent. An average of six bulbs will be installed per residence. Why wouldn't you want to use those?

A. I believe they have an average cost of about between 14 and $16 a pop.

Q. So is that a measure which isn't cost justified on the total customer cost test?

A. I would say that because it's not commercially available at this time what we have done is to bring in another technology into the family of energy-efficient lighting, which is to use the energy-efficient incandescent light.

Q. And it's not going to get you as much savings, obviously?

A. No, but people are going to be able to go out and buy them.

Q. Do you think this is an example where you're going to be reinforcing a marketplace in moderately more efficient bulbs rather than reinforcing a marketplace in significantly more efficient bulbs?

A. No, I don't believe we're doing that. I think we're looking at the end use of lighting as a family and recognizing that some technologies are immediately available to the customer and some are not,

the same way that we took the approach with compact fluorescents in bringing it to consumers' attention and putting it within their realm of availability.

It's not to say we're avoiding halogen lights, because we are promoting them as floodlights, but it makes more sense for the amount of energy savings and the cost for the six to eight bulbs that would be installed, that's $48 compared to an energy-efficient light, the same number of bulbs coming to a total cost of $4.50.

Q. But if the tungsten halogen bulbs are available and if their cost --

A. They're not though.

Q. Well, how does NYSEG do it?

A. Well, to my knowledge, there's only one manufacturer and that's Sylvania and they're not widely stocked through retailers.

Q. So they're on the market, it's just they're not regularly on the market if I go to Home Hardware yet?

A. To my knowledge they're not available widely, no.

MS. PATTERSON: Are these bulbs for halogen fixtures or that can be put into normal light fixtures?

MS. MITCHELL: They can replace a normal incandescent bulb, an A-line bulb.

MR. D. POCH: Q. And so certainly this is an example where you're telling me there's a technology out there, it may not be widely available but it's mass produced at this point by at least one manufacturer, other utilities are using it, it's more energy efficient, it isn't ruled out by your total customer cost test, it is significantly more expensive than what you're talking about doing--

A. Yes.

Q. --but it would be cost effective, it would --

MR. BURKE: A. I don't believe we've established that they're cost effective.

Q. Well, all right, maybe I misread that in.

MR. B. CAMPBELL: Who said it would be ruled out?

MR. D. POCH: Q. Is it cost effective; would tungsten halogen bulbs be cost effective, would they meet the total customer cost test?

MS. MITCHELL: A. Installing six to eight of them?

Q. Installing any of them.

A. I don't know. I don't know.

Q. All right. So there's a technology that's available that you just haven't, for whatever reason, just haven't put through the screening process to see then?

A. I'm not aware if it has gone through the screening process, but I can get back to you on that.

Q. If it went through the screening process and was found to pass the total customer cost test but is more expensive than these other bulbs although will save more energy if we put the other bulbs in, then wouldn't we be cream skimming; you'd be getting the cheaper savings but you couldn't go nearly as far and it's a branch in the road, you go one way or the other; right?

MS. MITCHELL: A. I don't think that's a fair assessment.

MR. BURKE: A. It's also the case we wouldn't go down the road too far before we could do it again if we changed our mind. After all, these bulbs don't last that long, I mean, the incandescent ones.

Q. But you will have gone into 600,000 thousand homes, gotten them on to this technology, got them climatized, accustomed to this technology and

reinforced distributor channels and so on for this technology, not the deeper savings technology?

MS. MITCHELL: A. No, I think what we've done is we've climatized consumers to energy efficiency, in which case it will make it that much easier once halogens are widely available that they'll be adopted.

Q. Now, by the way, you did mention compact fluorescents weren't in the initial plan and that was one of the examples of a technology that has since come in?

A. That's correct.

Q. All right.

MS. FRASER: A. They were in commercial.

Q. Sorry?

A. They weren't included in residential but they were in commercial.

Q. All right. And you're talking about $5 coupons off the retail price of compact fluorescents, $20 I'd assume?

MS. MITCHELL: A. Yes, that's correct.

Q. And, again a separate sheet, Exhibit 272 another excerpt from the PCRD, this is from Part II, Residential Volume 5.

You're assuming, down at net savings

megawatts, 3.51 megawatts in 1991 winter peak effect for that compact fluorescent multi-retailer program; this is where they take the coupon to Loblaws or wherever?

A. Yes, that's correct.

Q. All right. And so if we want to consider Hydro's commitment to this technology, residential lighting improvement, we have to consider the multi-retailer program in conjunction with the home tune-up visits, talking residential sector?

A. No, they're separate programs.

Q. That's right. And we would have to add the results--

A. Yes.

Q. --to get the total effect. Let's just look at page 153 of this volume, that is Volume 1 which is Exhibit 269.

This is BECo, Boston Ed materials that begin on page 150 and can you see at page 153 at the very bottom that BECo, in addition to leaving behind more bulbs, also has a rebate program for point of sale lighting retailers, but it's a point of sale program?

A. Yes.

Q. And are you aware that both BECo and NYSEG offer direct mail order catalogues to sell

various compact fluorescents bulbs and other efficient bulbs?

A. I 've read recently, yes.

Q. Would that be one way of addressing an immediate lack of availability of a wide variety of compact fluorescents because until consumer demand builds up you can't expect retailers to stock a whole variety of these bulbs?

A. That may be one way, however, we have chosen to go through retailers to create that marketplace and through advertising, which I think in NYSEG's program is recommended for longer term customer acceptance.

Q. But you've only got 11 or 15 watt bulbs in your program, so chances are you're only creating --

A. Of compact fluorescents?

Q. Yes.

A. Yes.

Q. All right. And if you look at page 192, this is the catalogue, part of the catalogue they send out, I counted up the permutations and combinations and got 33 different kinds of bulbs there, some compact fluorescents, some not, some regular circ light fluorescent and some halogen, so clearly that --

A. Well, we don't restrict our information that we provide to consumers.

Q. All right. But you may have a hard time getting these bulbs, especially in Canada?

A. At this time, yes.

MS. FRASER: A. We have gone from a situation where it was absolutely impossible to get them to where retailers are now hounding the manufacturers so they can get them.

MR. WILSON: A. Mr. Poch, are you characterizing this as a catalogue that all the customers of BECo have delivered to their door?

Q. No, I just understand that this is something you get, that's available, you can send off and get these bulbs, you can get a rebate for these various bulbs and they give you a list of where you can get them and so on.

Is that your understanding? That's how I'd read it.

A. Well, it looks like a good idea. I just notice on the top of page 195 that you have to have an electrician's licence in order to order these things.

Q. Or you can fill out a form to show how you've installed it yourself, I think; right?

They'll give you a permit number if you install it in a fixure yourself. That might be a barrier to that program.

A. It sounds like a little bit of a hurdle for my grandmother.

Q. Yes, it might be. And so I take it then one way around that program is, when you're in the house and you've got your technician in there so he can size up if it's going to be -- you know, make sure it gets installed right, if they had an array of 33 versions of bulbs in the van out front that would be a really great opportunity then to both get an array of these products out there and make sure that they get installed right without putting that kind of cost on a customer which would obviously be a big hurdle; wouldn't it?

MS. MITCHELL: A. That's certainly an idea we would look at, yes.

Q. And it's sort of reminiscent of when Ontario Hydro went around and converted every motor and appliance in the province from 25 hertz to 60 hertz, they had these vans and they went street by street and they had whatever they needed on hand?

MS. FRASER: A. I could give you my contrasting energy efficiency demand side management

treat as vis-a-vis frequency conversion, but it would take quite a while. I can start it off tomorrow, if you want.

Q. In short, I think times were simpler then.

A. Times were simpler and it was one job to do, it was a finite job and the market changed at the same time.

Q. Okay.

MR. D. POCH: Mr. Chairman, that's a good point to break. I hesitate to guess but I do anticipate finishing before the end of the day tomorrow, and I may be kidding myself on that as I see more and more pages here.

Until I go through and try to edit this down tonight, I can't really be more helpful than that.

THE CHAIRMAN: All right. Well, we will --

MR. B. CAMPBELL: Could I get some idea of what - if Mr. Poch does finish, say, afternoon break time - what we would expected to deal with the balance of the day? I'm not exactly clear under those circumstances who the next cross-examiner would be.

We have some indication from Mr. Greenspoon as to the material he'll be using in

cross-examination, we have no indication as yet from Energy Probe as to the material that they'll be using and it's quite a job sometimes to get the stuff together that these folks need to look at.

...

[5:06 p.m.] THE CHAIRMAN: All right, Mr. Greenspoon, you are not going to go on until the 11th of September, is that correct? That's Wednesday, the 11th of September?

MR. GREENSPOON: That would be fine with me. I should say that I did give my friend an exhibit list, so that during the week off these people have something to do.

THE CHAIRMAN: Well, you may call it a week off. I think it will probably be a fairly intense week.

MR. GREENSPOON: Oh, I meant for the panel, I meant for the witness panel.

THE CHAIRMAN: Then Energy Probe will be following you. Tomorrow we have --

MS. MORRISON: Energy Probe said they'd be ready for Monday, September 9th. The Ontario Federation of Agriculture is prepared to go tomorrow afternoon.

THE CHAIRMAN: Well, here's Mr. --

MR. ADAMS: Perhaps I can assist. Energy Probe won't have counsel available tomorrow. Counsel is involved in another trial.

THE CHAIRMAN: We won't call you tomorrow.

MR. ADAMS: And Ontario Hydro has been notified that they are going to have a list of our materials by Tuesday.

THE CHAIRMAN: You are prepared to go on the 9th?

MR. ADAMS: Yes.

THE CHAIRMAN: Do you have any idea now, Mr. Adams, I'm not quoting you, but just a rough idea of how long you might be?

MR. ADAMS: We were telling people half a day to a day. Our current expectation is around a day. We don't expect to be less than -- well, we don't expect to be half a day, we expect to be more than that.

THE CHAIRMAN: So, at the moment it looks like you will be on on the 9th of September.

MR. ADAMS: Very well.

THE CHAIRMAN: Monday, is that right?

MS. MORRISON: Yes, and the Ontario Federation of Agriculture will fill tomorrow, if Mr. Poch finishes early.

THE CHAIRMAN: Yes, the OFA, and Mr. Thomson is not here right now, I know, but he has confirmed that, so he will be available to finish up tomorrow. He said, as he always does, that he won't be

very long.

Then Mr. Harry Poch, I think you are the next one after that, after Northwatch at the moment.

MR. H. POCH: Yes, sir. So, that will take us to about the 12th.

THE CHAIRMAN: Well, Mr. Greenspoon, as I understand it, expects about a day, is that right?

MR. GREENSPOON: Yes, sir.

THE CHAIRMAN: So, the 12th. That's Thursday.

MR. H. POCH: Yes, sir.

THE CHAIRMAN: I think that's enough predictions for the moment.

MR. B. CAMPBELL: So far. I am sorry to be a pest about this, but we did try to line up the right materials out of the humongous stack of materials, and so far what happens on -- I'm not sure what happens on the 10th. We have got Energy Probe on the 9th, which we anticipate might take a day, Mr. Greenspoon starting on the 11th. We still have to fill in on the 10th?

THE CHAIRMAN: We don't really have the 10th filled in yet.

MS. MORRISON: I'm working on it, Mr. Campbell.

MR. B. CAMPBELL: I will stay in close touch. Thank you.

THE CHAIRMAN: Tomorrow morning at 10:00 o'clock.

---Whereupon the hearing was adjourned at 5:10 p.m. to be resumed on Thursday, August 29, 1991, at 10:00 a.m.

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